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ABSTRACT

This publication provides the elementary teacher with sequential and developmental objectives in the areas of plants, animals, ecology, and physiology. At least one motivating "hands-on" activity is included for each objective. Age level (5-8, 8-10, 10-12), process emphasized (classification, experimenting, etc.), and group size (independent study, small group, etc.), are indicated for each activity. Also, materials, procedures, indication of mastery, variations and extensions, interest span, related subjects, and practical hints are given for each activity. The teacher may use this publication as a source of science activities or for an elementary science program. (MR)

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# BASIC BIOLOGY FOR BEGINNERS

# BASIC BIOLOGY FOR BEGINNERS

by
Pamela Gustafson Anderson
and
Juanita S. Sorenson

## TO THE TEACHER

Science has long been an area in the elementary school that has often been pushed aside because of other priorities. Many elementary teachers have not had the time and energy to develop a strong and developmental program in the area of science. They have used whatever "bits and pieces" of materials that were available instead of looking at science as a whole, and planning a sequential and developmental program as they do for reading and math.

This booklet takes one part of the whole, the life sciences, and provides the teacher with sequential and developmental objectives in the areas of plants, animals, ecology, and physiology. In addition, at least one motivating "hands on" activity is included for each objective. The age level (5-8, 8-10, 10-12), process emphasized (classification, experimenting, etc.) and group size (independent, small group, etc.) are indicated for each activity.

The authors would like to acknowledge the contributions of Esther Henton, Sue Eldred and Karen Otto in preparation of activities; Laura Manthey for the artistic illustrations; and Virginia Reece and Barbara Zadrazil for typing and formating the activities.

University of Wisconsin-Eau Claire
July, 1977

P.G.A.
J.S.S.

This product was developed as a part of the ongoing preservice and inservice teacher education program in the Department of Elementary Education at the University of Wisconsin-Eau Claire.

c Pencraft 1977

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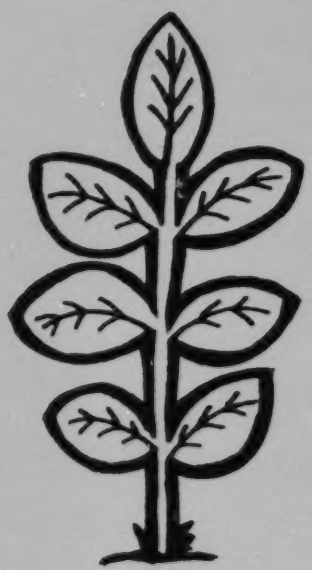

# PLEASURABLE PLANTS

# PLANTS


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# PIZZA PLANTS

Objective(s): The student will be able to classify objects as plants and non-plants.

Materials:

1. Cardboard pizza plates with pictures of objects that are either plant or non-plant glued at even intervals around the edge. Also, on the reverse side of the plate, behind each object, it should indicate plant or non-plant to allow for student correction.

2. Clothespins with plant or non-plant written on each.

Procedures:

1. Explain the device to a group of children or individuals as follows:

   a. Show pizza plates and clothespins. Tell the children that the pictures on the plate are either a plant or a non-plant and they are to clip the clothespins that are labeled plant or non-plant on the matching pictures.

   b. Explain to the children that the answer is correct if they turn the plate over and the words on the pin are the same as the words written behind each picture.

Indication of Mastery:

Observation of completed activity by having the child show you a plate that is completely clipped.

Variations and Extensions:

1. This is a good activity for any type of classification activity in science. It also could be adapted for language arts (writing and spelling), mathematics (numeral recognition) and reading (sounds of the alphabet and words for pictures).

2. Make several plates of varying difficulty and keep a graph (if more than four or five of these are used) to show which children have completed each plate.

Interest Span: 10-15 minutes (depending on the number of plates used).

Related Subject Areas: Reading, Language Arts, Mathematics

Practical Hints:

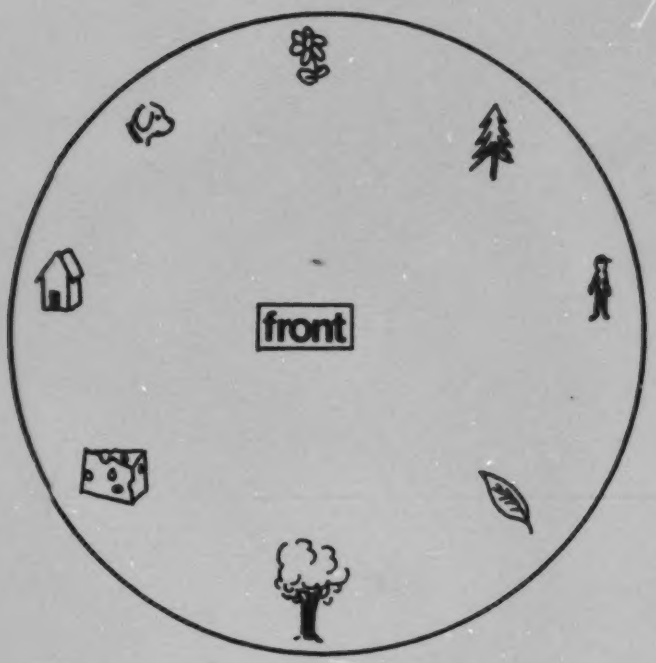
1. Purchase unused pizza plates at pizza restaurants (they are 5 to 10 cents depending on the size).

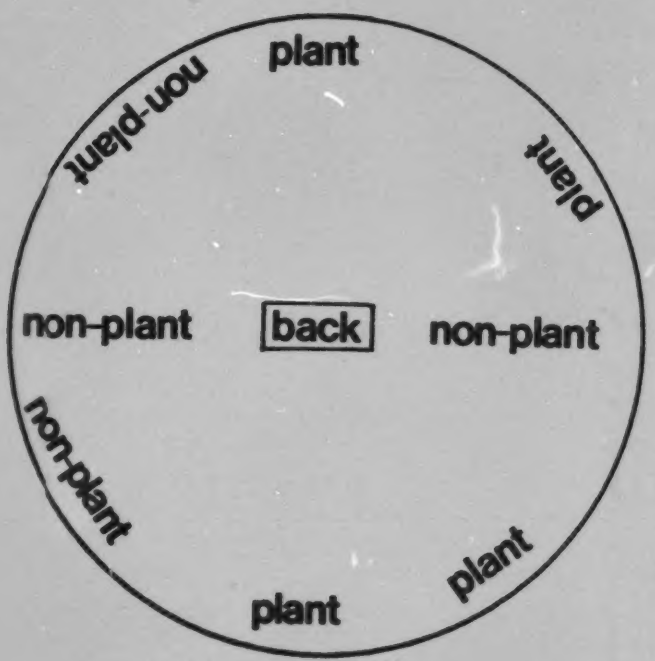
2. Cut out pictures from catalogs, magazines, newspapers and old workbooks (colored pictures are more attractive).

3. Store clothespins in two Pringle's potato chip cans covered with construction paper. Label one "plant", the other "non-plant."

4. Laminate pizza plates for durability.

## SAMPLE WHEELS



# ROYAL PLANT OR NON-PLANT

**Objective(s):** The student will be able to classify objects as plants and non-plants.

**Materials:**

1. A card for each child with a picture of an object that is either a plant or is not a plant. Print the name of the object on the card.
2. Four chairs (two pairs) that are symbolic of thrones. Each chair should have a picture of an object (two plants and two non-plants) that the children can identify whether or not their object and the title on their crown match.
3. Four crowns with these names: King Plant, Queen Plant, King Non-plant, and Queen Non-plant.

**Procedures:**

1. Hand out a plant or non-plant card to each child.
2. Explain to entire group that we are going to pretend that the class lives in different countries and that the name of the countries are Land of Plant and Land of Non-plant. Have children look at cards to see what country they would belong in and ask for volunteers. The first four children to give suggestions become king and queen of the countries or the teacher may select the king and queen. Give them the crown that matches their card and see if they can find the proper thrones. After the kings and queens have located the proper throne, the students, one at a time, can identify what country he or she belongs to by handing his or her card to the king or queen of the country that matches the card. As he/she hands the card to the king or queen he or she should say "I am a (e.g. sunflower). I belong to the country of (plant).
3. After each child has had a turn, the kings and queens return to their places. Review what cards belong to each country, by flashing the cards to the class and correcting any mistakes. Ask children to give other examples of objects that could belong to each of the countries.

**Indication of Mastery:**

Participation in activity and review. Observation by teacher.

**Variations and Extensions:**

1. Develop more than one set of cards with different names to provide additional practice.
2. Change name's of countries to other plant classification categories (or to other concepts). For example, plant habitats or animals and non-animals.
3. Have children make their own card sets.
4. If the children can't grasp the idea of the picture on the throne, put cards on the throne identical to the cards on the crowns.

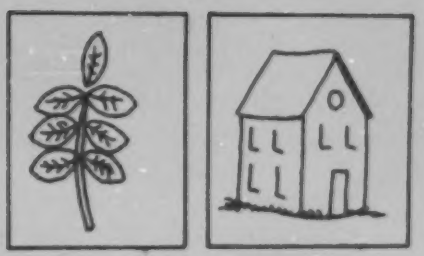
**Interest Span:** 20-30 minutes

**Related Subject Areas:** Language Arts

**Practical Hints:** Laminate cards for durability

SAMPLE CROWNS

SAMPLE CARDS



# PLANT PIES

Objective(s): The student will be able to identify the basic parts of a plant.

Materials:

1. Five cardboard circles for each student. On each circle draw lines so that it is divided into fourths. The reverse side of the circle should name one part of a plant, either stem, leaf, root, flower or seed. Each student should have 5 circles--one indicating each of the parts.

2. Old magazines or other books that include pictures of different types of plants.

Procedures:

1. Tell the class that today they are going to make plant pies. Each student will make five different pies, and the ingredient for each pie is named on the back of the pie. List the ingredients (stem, leaf, root, flower, seed) for each of the five pies on the board. Read to the class to be sure they recognize and understand each part.

2. Let children choose an old magazine or book. Give each of them a set of pies and point out how the pies are divided. Tell them to find a picture that matches the word on each pie and put it in every section of that pie. For example, the "leaf" pie might have a picture of four different kinds of leaves--one in each section.

Indication of Mastery:

Pies should be completed with 75% accuracy.

Variations and Extensions:

1. Take a nature walk and let children draw the different kinds of leaves and other parts on the appropriate pies. Or make the pies bigger and have the children glue the actual part (e.g., real leaves) to the pie.

Interest Span: 45-60 minutes.

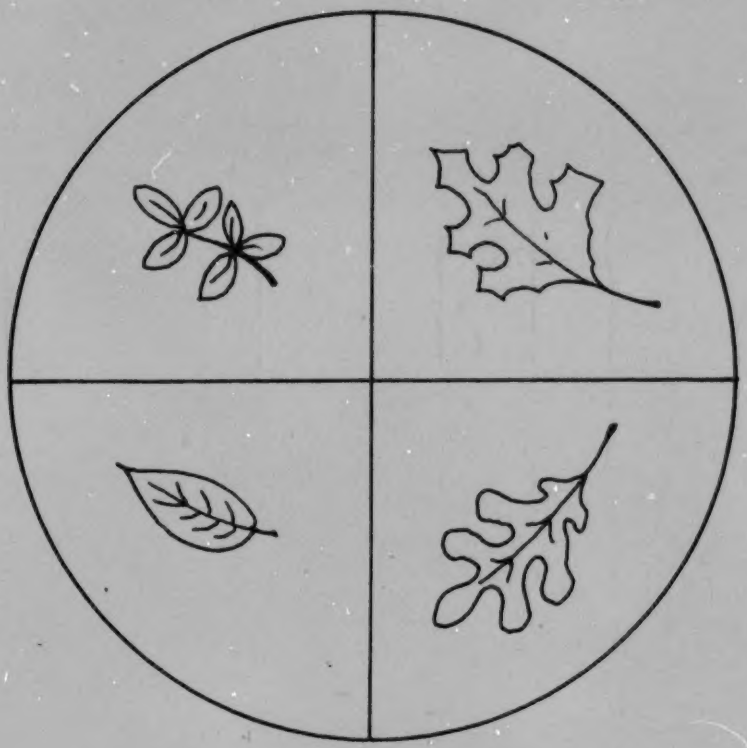
Related Subject Areas: Reading

Practical Hints:

1. Make sure the magazines and books you use have a wide variety of plants and include all of the parts.

2. Make sure the children understand the concepts of the different parts and recognize each. Walk around the room as this activity is going on to help children that don't understand.

## SAMPLE PIE



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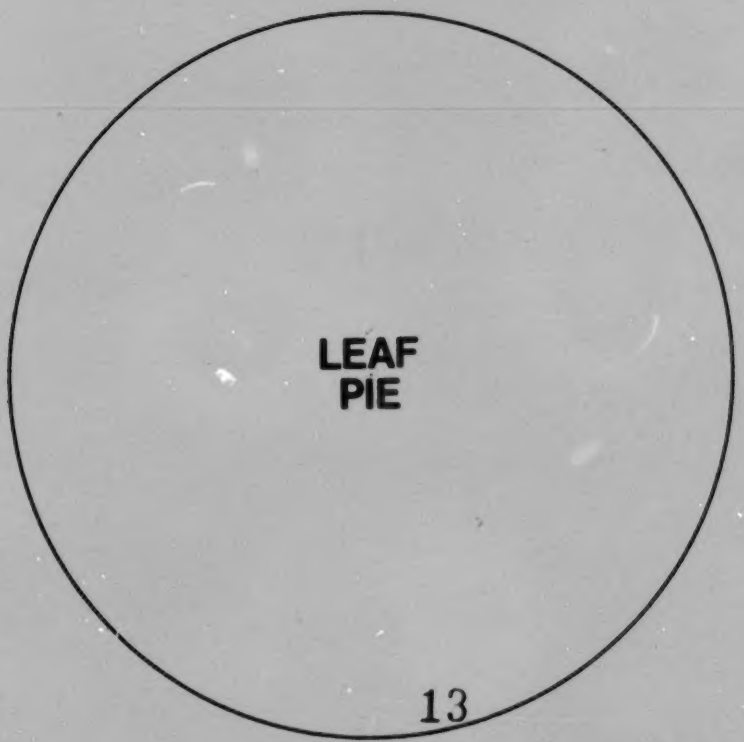



Back

# PLANT ME

Objective: The student will be able to describe and diagram inter-relationships between stages of plant growth by growing their own plants.

Materials:

1. Bean seeds
2. ½ pint size of empty milk cartons (one for each student)
3. Potting soil
4. Small pebble or rocks
5. Scissors
6. Aluminum pan
7. Paper towels
8. Plastic wrap
9. Magnifying lenses
10. Drawing paper and markers

Procedures:

1. Pass out a bean seed to each student and have them describe it orally.
2. Have the children draw their bean seed and label the diagram Stage 1.
3. Explain to the children that they are going to try to grow a bean plant from their seed.
4. Wet the paper towel and place the bean seeds on the bottom of the aluminum pan.
5. Have the students place their seed directly on the toweling and cover the pan with plastic wrap. Place the pan where sunlight is plentiful.
6. Have the students observe the seeds and record their findings on a daily basis.
7. After the seeds have sprouted, have the children make a drawing and label it Stage 2.
8. Prepare the milk cartons for planting by trimming the milk cartons down and punch holes in the bottom of the container.

9. Sprinkle a layer of gravel on the bottom of the container and fill it 3/4 full with dirt.
10. Have the children make a small indentation in the dirt and place the seed in it.
11. Pour a drop of water over the seed and cover the seed with another layer of dirt.
12. Place the container in direct sunlight and water so that the soil is just moist.
13. Have the students observe and record their findings on a daily basis.
14. Have the children diagram the results as the seed starts to break through the soil. Label the picture, Stage 3.
15. Display diagrams in sequential order and discuss as a large group the various stages of plant growth. (e.g. What would be the result if the seed had poor roots?)

Indication of Mastery: Completion of the experiment with recorded data.

Variations and Extensions:

1. Have a group or team of students plant a different type of plant and compare results.
2. Design the experiment so that other variables alter the various stages of plant growth. (Such as water, sunlight, soil, etc.)

Interest Span: 3-4 weeks

Related Subject Areas: Language Arts

Practical Hints:

1. Have a specific space for the experiment.
2. Check the recording process of the students periodically.

# PEOPLE PLANTS

Objective(s):

1. The student will be able to identify basic parts of a plant.
2. The student will be able to identify needs of a plant for growth.

Materials:

1. A name card for each student, which will individually name the parts of a plant and the needs of a plant for growth. There should be one card for each of the following:

| | |
|---|---|
| soil | sun |
| seed | rain |
| roots | flower, fruit, or vegetable (optional) |
| stem | |

2. A fairly large open space with enough room for seven children to move comfortably.

Procedures:

1. Hand out a name card to each student in the group.
2. Read the following poem and have the children act out the growth of a plant as it is read. Tell the children to position themselves as close as possible to a real plant.

I saw a little patch of soil
that looked so very bare.
So I decided to take a seed
and plant it right there.

First I dug a little hole,
next I dropped the seed.
Then I began to wonder
just what the seed would need.

As I was wondering the sun
began to show.
Then suddenly I remembered
the sun helps plants grow.

While the sun was shining
something was happening underground.
The seed was slowly changing
then a root could be found.

The little stem grew taller
as the days passed by.
Then it grew lots of leaves
and the sun still shined in the sky.

More days passed and we had
another rain shower.
And at the very top of the stem
there was a pretty flower.

Now the little patch of soil
was no longer bare.
Because of rain and sun
a seed grew into a flower there.

Indication of Mastery:
Participation in activity and observation.

Variations and Extensions:
1. Let the children make up words when acting out parts. For example the sun could say "I am the sun and I shine, shine, shine all day long. Without me plants could not grow."

Interest Span: 20-30 min.

Related Subject Areas: Language Arts

Practical Hints:
1. Read the poem slowly and make sure the children have to act out the parts and express themselves fully.
2. Make the name cards colorful and attach string to them so the children can keep them on. One suggestion would be to make them out of cardboard cut into circles. Punch holes around the entire edge and lace yarn so that there are two long ends to tie loosely around the child's neck.

Sample Picture:

# SILLY STRINGS

Objective: The student will be able to identify different ways in which plants are started--cuttings, seeds, or bulbs.

Materials:

1. A 8 x 9 inch piece of cardboard or heavy tagboard. Draw a line on the card dividing it into half. This line should be parallel to the longer edge of the card.
2. In the right hand column print the words seed, cutting, bulb and insert a large paper fastener directly to the left side of the first letter of each word.
3. In the left hand column print a list of ten to fifteen plants, making sure there are three to five samples of plants that can be started in each of the three ways listed in the right hand column. Insert a small paper fastener to the side of the first letter of each name of a plant.
4. Connect an eight inch piece of string to each small fastener by twisting one end of the string around the fastener.

Procedures:

1. Let children match the name of the plant to the way it is started by connecting the strings from the small fastener to the large fastener. For example, a tulip plant would be connected to the word Bulb.

Indication of Mastery: Completion of string matching with 80% accuracy.

Variations and Extension:

1. This device works well for any classification activity such as plant and non-plant. It also works well for matching such as connecting the metric prefix with it's numerical value.
2. Let the children make their own string charts using the plants of their choice. Give them a card with everything the same as above with the exception of the list of individual plants. After they have made their own, have them exchange them with each other and correct each others.

Interest Span: 10-15 minutes

Related Subject Areas: Reading

Practical Hints:

1. After you insert the fasteners, tape down or cut off the long stems on the reverse side to avoid cuts and scratches.
2. Dip the end of the string to be twisted around the small fasteners in glue so the strings will stay attached longer.
3. Discuss why bulbs and cuttings are used instead of seeds to start some plants.

## SAMPLE SILLY STRING CARD

| | |
|---|---|
| o tulip<br>o bean<br>o iris<br>o chrysanthemum<br>o lily | o seed |
| o carrot<br>o onion | o bulb |
| o geranium<br>o lettuce<br>o African Violet<br>o celery | o cutting |

# THE PLANT MAID

**Objective:** The student will be able to classify plants according to their environments.

**Materials:**

1. A set of 21 playing cards which includes ten plants and ten environments that match each of these plants. One card is a comical plant labeled the "plant Maid". (see sample cards) A set of cards could include:

| | | |
|---|---|---|
| seaweed--ocean | cactus--desert | dandelion--lawn |
| flower--garden | grass--lawn | moss--rock |
| tree--woods(forest) | corn--field | plant maid card |
| potted plant--house | algae--pond | |

(A picture and the name of the plant or environment should be on each card.) All the plant cards should be drawn on a green background and all the environments on a white background.

**Procedures:**

1. Ask children if they have ever played "Old Maid". Explain the plant maid game according to the same rules.
2. Deal entire deck of cards to a group of four to five children.
3. Have children take turns drawing cards from each other to obtain matching pairs--a plant with the environment where it is usually found (e.g. corn and a field.) Tell the students that each pair has to have one white and one green card.
4. Continue drawing cards from each other until one person ends up with the odd card and becomes the "Plant Maid".
5. The person who is the plant maid can call on each of the players individually to share the pairs that he or she has obtained. When a child is showing pairs, he or she is to say which is the plant and which is the environment where it is usually found. Also, the child is to name other places where he or she has seen this particular plant.

**Indication of Mastery:** Participation in activity and discussion.

**Variations and Extensions:**

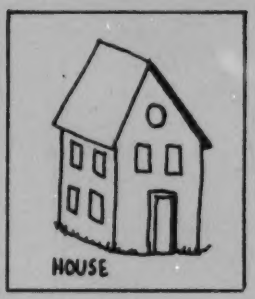
1. Give each player a list of all the possible matches and have him or her check off each of the pairs as the game is played.
2. Use the cards for an independent activity, allowing a child to match all of the pairs.

**Interest Span:** 30-40 minutes

**Practical Hints:**

1. Laminate the cards for durability.
2. Paste real playing cards to the reverse side so deck is authentic.
3. Observe and participate in the discussion so that the children don't obtain or give false information, or let an older student or tutor supervise the discussion.

# SAMPLE PLANT MAID CARD



Plants/Predicting
Experimenting
Interpreting Data
Measuring
5-8/Independent

# SLIDE-A-PLANT

Objective: The student will be able to predict plant growth and test the predictions.

Materials:

1. White styrofoam cup, dirt, tulip bulb for each student.
2. Sliding plant graph for each student. This graph consists of a picture of a pot and it has two slits (one near the bottom and the other at the very top) which are wide enough to pull through them a green strip of paper that is the stem of the plant growing in that pot. As the stem is pulled upwards, it moves along a centimeter scale which is printed to the right of the pot and starts immediately at the top of the pot. (See illustration).
3. One paper tulip and several paper leaves for each student.
4. One paper clip for each student.
5. Several full grown tulips.

Procedures:

1. Plant the tulip bulbs in the cups. Have each child write his or her name on the cup. Place in a well lighted spot and water daily. Each child should be responsible for his or her plant and there should be time alloted for this task.
2. Pass out the slide-a-plant graphs to each child. Explain how the slider works and how it represents a plant stem. Have the children put their names on the picture of the pot.
3. Show the children the full grown tulips and let them measure the stems. After they have had time to look at them and estimate how long they are, have them predict how high they think their plant will grow. They should mark their predictions on the slide-a-plant graph by putting a star by that number on the centimeter scale.
4. As the plant grows, measure it. Each time it is measured move the slider on the plant graph the same distance. Between the actual measuring times clip the slider at the bottom of the pot so it stays in place.
5. After the plant stops growing, measure the distances of all the leaves from the bottom of the plant. Paste them on the slider at the same distances.
6. If the plant blossoms, paste the flower at the top of the slider.
7. Look at the chart to see how close the growth of the plant came to the prediction that was made and discuss any major differences.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Let the children work in groups of three. One child should grow the plant normally, one should deprive it of light, and the other should deprive it of water. Follow the same procedures and compare the three during and at the end of a period of time.

Interest Span: 3 to 4 weeks.

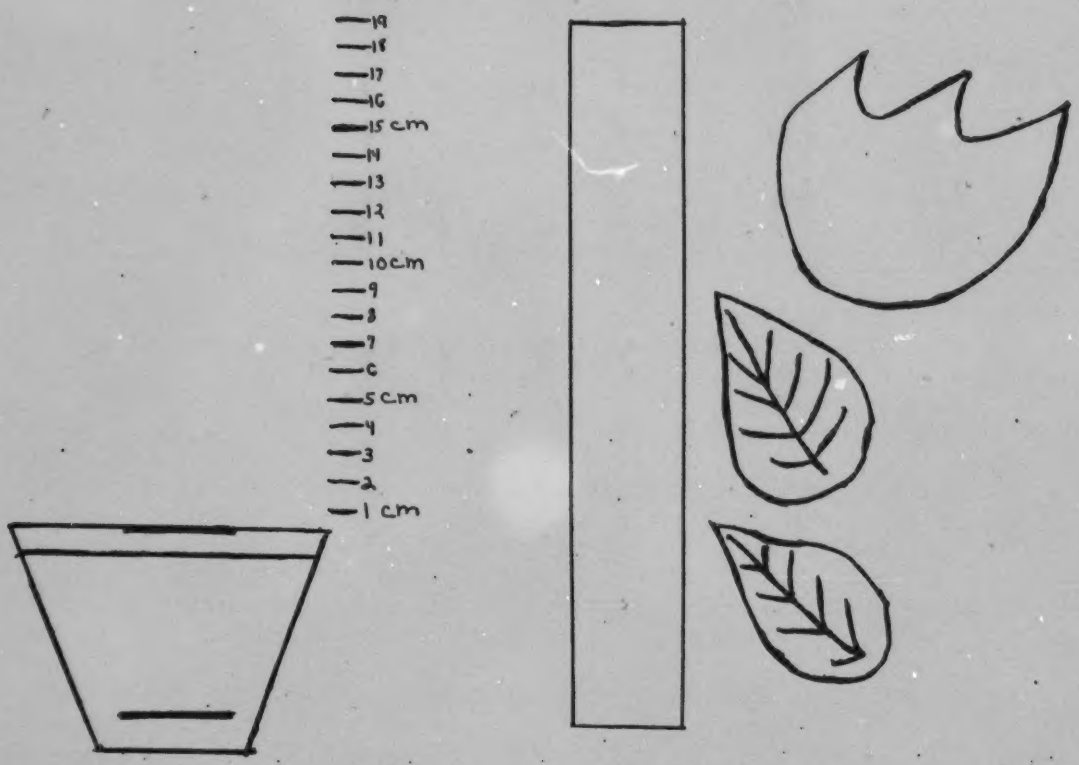
Related Subject Areas: Fine Arts, Math

Practical Hints:

1. Make sure each child has a plant that is growing. Plant 3 or 4 extra bulbs for emergencies.

2. Have extra charts available and laminate them so they last for the duration of the activity.

Sample Materials for Slide-A-Plant



# THE SEED STORE

Objective: The student will be able to classify plant seeds according to physical characteristics.

Materials:

1. Four pairs of small boxes. The pairs should be labeled as follows:
   a. small, big
   b. smooth, rough
   c. round, square
   d. light, dark
2. A larger box containing a mixture of seeds. Some seeds that can be used are: Sunflower, orange, grapefruit, bean, pea, corn and any others.
3. Four cards labeled "Grocery List" -- one of each of the following:
   a. Ten Big Seeds, Ten Small Seeds
   b. Ten Smooth Seeds, Ten Rough Seeds
   c. Ten Round Seeds, Ten Square Seeds
   d. Ten Light Seeds, Ten Dark Seeds

Procedures:

1. Give a child one of the lists, the two boxes that match and the box of seeds. Tell him/her to pretend that he/she is a store manager and has to find the items on the list for you. Using the box of seeds, the student is to pick out the seeds on the list and put them in the proper box. For example if a child is given the list that says "Ten Big Seeds, Ten Small Seeds", he/she will pick seeds out of the box that fit this characteristic and put them in the boxes that say "Small Seeds" or "Big Seeds".
2. Repeat this activity using each of the grocery lists. Make sure that the child shows you the boxes each time he or she is given a new list.

Indication of Mastery: Completion of activity and observation by instructor.

Variation and Extensions:

1. Print up some money that says "seed money". When the child brings you the seeds in the boxes check his classifying; if it is correct, pay him/her for the groceries.
2. Let other children be the customers and let them correct each others work.

Interest Span: 30-40 minutes

Related Subject Areas: Reading, Language Arts

Practical Hints:

1. Have a variety of seeds.
2. Keep seeds covered when not in use.

# POT LUCK DINNER

Objective: The student will be able to list foods that come from plants.

Materials:

1. Five sets of pictures which would include pictures of things to be consumed at a meal. A set of pictures could include:
   - a glass of milk
   - a piece of bread
   - a bowl of lettuce
   - an egg
   - ham
   - a piece of apple pie
   - a salt shaker
   - a pepper shaker
   - pickles
2. Five large, laminated cards that contains a picture of each set. The title of the card should be "Pot-Luck Dinner". To the right of the pictures make two columns headed "Food that Comes from Plants" and "Food that Doesn't come from plants".

Procedures:

1. Divide class into five small groups and have one group go to each (previously set up) learning station. The stations will include a set of pictures, a large card, and a felt pen on a table. Have a chair for each child.
2. Give the following instructions to all of the small groups:
   a. Let's pretend we are going to a pot-luck dinner. Take a picture card in the center of the table and look at it. This picture is what you are going to bring to the dinner. Leave it face down on your lap so what you are bringing to the dinner is a secret.
   b. Take turns showing your pictures to your own little group. When you show your picture, tell your group whether your food comes from a plant or if it doesn't come from a plant. Then look at the large card on your table. Find the name of the picture you have in your hand. But a check in the first column if your food is a plant. If your food is not a plant, put a check in the second column. (It is a good idea to demonstrate this as you are explaining.)
   c. After everyone has had a turn think of other things you could bring to the dinner. Make sure you tell your group if it is a food that comes from a plant or a food that doesn't come from a plant.

Indication of Mastery: Observation and completion of activity by each child. It would also be possible to have children write individual lists, -- using the same categories as the card, -- to be turned in.

Variations and Extensions:

1. Rotate groups so each group has a chance to use all sets of pictures.
2. Have children make their own dinner by drawing or cutting out pictures.
3. Use school menu for pictures and then go to lunch together.

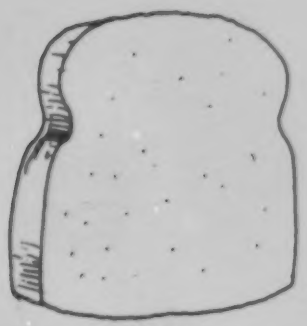
Interest Span: 20-25 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate pictures and cards for durability and to be able to wash markings off to use over.

## SAMPLE PICTURE CARD



BREAD

## SAMPLE ANSWER CARD

| Pot-Luck Dinner | | |
|---|---|---|
| name of food | plant food | non-plant food |
| bread | ✓ | |
| lettuce | ✓ | |
| eggs | | ✓ |
| apple pie | ✓ | |
| salt | | ✓ |
| pickles | ✓ | |
| pepper | ✓ | |
| ham | | ✓ |
| milk | | ✓ |

# SEED SHUFFLEBOARD

Objective: The student will be able to classify seeds as edible or non-edible.

Materials:

1. Game board for seed shuffleboard (see next page). This board can either be drawn on cardboard or directly on the floor with chalk. Also, it should include a picture of the seed, a picture of the plant that it comes from and the name of the seed.

2. Erasers for playing pieces.

Procedures:

1. Show children how to play by throwing an eraser on the board and telling them whether or not the square the eraser landed on is a seed that is usually eaten or a seed that is not eaten. Explain that a correct answer is worth one point.

2. Allow a small group of children to take turns throwing the eraser. Designate one child as the scorekeeper or do it yourself. Allot a certain amount of time in which the game is to be played. The person with the highest score at the end of this time is the winner.

3. A child that misses a square completely should be allowed another turn.

Indication of Mastery:

Observation and participation in activity.

Variations and Extensions:

1. Use the shuffleboard for other classification categories such as plant and non-plant, animal and non-animal.

Interest Span: 15-20 minutes.

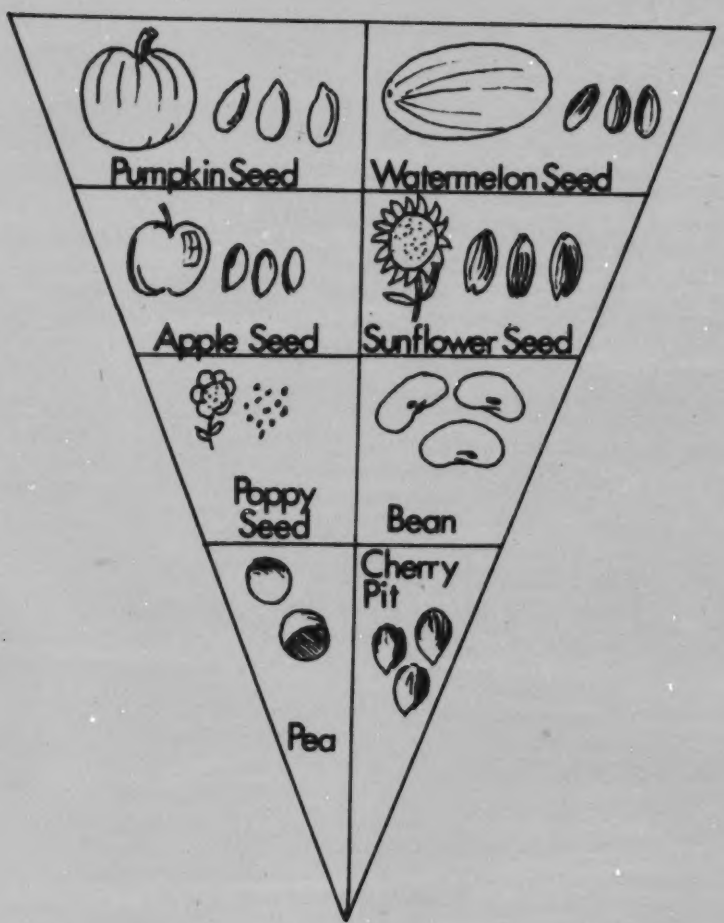
Related Areas: Reading

Practical Hints:

1. Make sure the seeds illustrated on the board are familiar to the children and are distinctly edible or non-edible.

2. Make the board as colorful as possible. Colored tagboard works well and is durable.

## SAMPLE SEED SHUFFLEBOARD



# PLANT PUZZLERS

Objective(s): The student will be able to list plants that make our world more beautiful.

Materials:

1. Tape recording of plant puzzlers, riddles about plants written in a poetry format.
2. Answer card to go with recording.

Procedures:

1. Make a tape and answer card using the riddles listed below. The card will code the riddles identically to the tape so that the child can easily follow along. For example, the first riddle listed below has a number "1" with a circle around it. The tape recording should say this is plant puzzler number one: "Find the 1 with a circle around it on the card in front of you. When you have finished listening to the riddle, circle the picture that solves the riddle."

    1. I can be many colors, as you have seen
    But I want you to know that part of me is always green.
    Can you guess who I am? Please don't take an hour!
    You sometimes can smell me, I am a (flower) !

    2. I am beautiful and I can grow very tall
    My leaves turn colors in the fall.
    In the winter my bare branches you'll see,
    Yes you guessed it, I am a tree.

    3. I live by houses, in fields, and by trees
    Sometimes I'm a home for insects and bees.
    I'm always green and I grow quite fast
    Yes, you guessed it, I am the (grass)

    4. I make the world beautiful as you will see
    I grow many places, sometimes by a tree.
    Another hint is my name rhymes with Vern
    Yes, you guessed it, I am a (fern) .

Indication of Mastery: Completion of answer card with 75% accuracy.

Variations and Extensions:

1. Use large scenic pictures and have children look for the answer to the riddle in the picture.
2. Make the answer card into a worksheet.

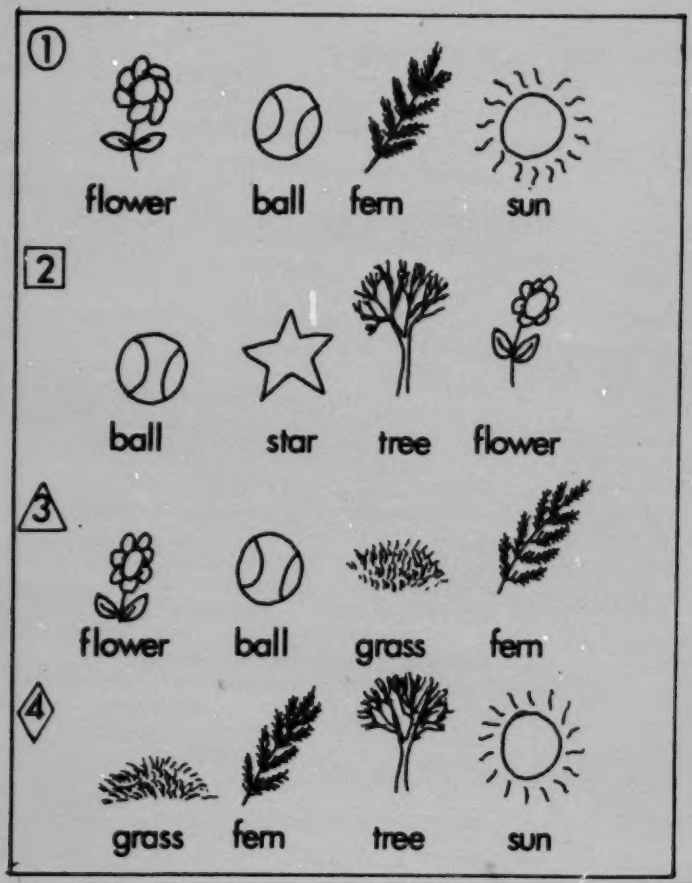
Interest Span: 20-25 minutes.

Related Subject Areas: Language Arts

Practical Hints:

1. Use different, unfamiliar voices for each riddle. Make sure voices are clear and slow.
2. Laminate answer cards.
3. Add more rhyming riddles and make other answer cards.

# SAMPLE ANSWER CARD



# THE TALKING TREE

**Objective:** The student will be able to describe ways in which man and other animals use trees.

**Materials:**

1. Large model of a tree made out a refrigerator or other box large enough to hold a person. Cover the box with brown paper and decorate it with human features. Cut out large eyes and make them movable by making the lids out of paper and attach from the inside of the box. Draw or paste on a nose, mouth and eyebrows. Large eyelashes can be made of strip of black construction paper curled around a pencil and gluded by the eyes. Make branches by covering strips of heavy cardboard with brown paper. The strips can be of various lengths and attached to each other to form a main branch with smaller branches. Then, the main branches can be attached to the tree by sticking them in holes cut in the top and sides of the tree. Cut out leaves and fruit (optional) and attach them to the branches.
2. Create a story about the particular kind of tree you made. Include a short history and emphasize the many uses man and other animals have for trees. Some of these may be firewood, bird nests, to climb in, to make the land more beautiful, for food, shade, and for squirrels to live in. A sample story is included on the next page.

**Procedures:**

1. Assemble a group of children around the tree. Make sure a person is previously in the tree and is equipped to tell a story. When the children are first near the tree, have the eyes closed so it appears to be sleeping. The teacher should knock on the tree and say, "Talking tree, wake up! Can you tell us your name and a story about yourself?"
2. The person inside the tree responds and tells the story.
3. After the story is over, allow the children to ask the tree questions. The teacher can call on the child by saying his name so the tree can answer the question using the child's name.

**Indication of Mastery:** Participation in Activity

**Variations and Extensions:**

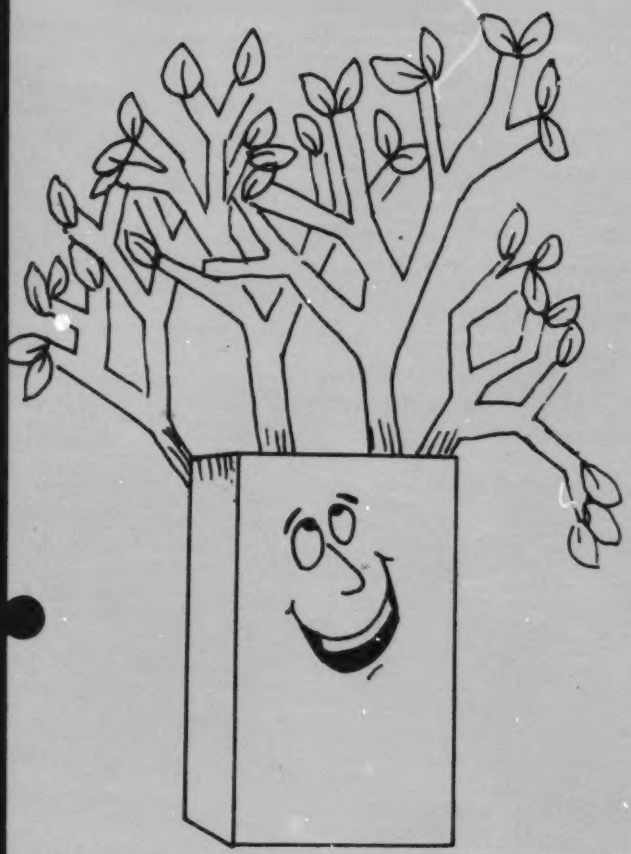
1. Lay a diagram of tree rings on top of the tree to use if the children ask the question about age. This way the teacher can hold the diagram while the tree explains.

**Interest Span:** 20-30 minutes

**Related Subject Areas:** Language Arts

**Practical Hints:**

1. Use a person in the tree the children don't know so they can't recognize the voice.
2. To get as much use as possible out of the tree and to make the time and effort put into the tree worthwhile, make this a project for an entire school.
3. Construct the parts of the tree and put it together just before it is to be used. It is hard to move when put together because of its size.



## SAMPLE TREE STORY

Hi! I'm Annie the Apple Tree and I thought it would be nice to tell you a little about myself. For the most part I just stand here and look beautiful. During the spring my leaves are a bright green and I have blossoms on my branches. When fall comes along my leaves turn colors and eventually they all fall off. Sometimes when I am standing here children just like you sit in my shade or else they climb in my branches. I love to have children enjoy themselves.

Besides having children in my branches I also attract birds and other animals. In fact one day a little while back a bird built a nest in one of my branches and a week later you could hear little cheeps from the baby birds that lived in that nest. I would tell all the squirrels and rabbits to be quiet when the baby birds were sleeping. Now they have grown up and flown away to make their own nests in other trees.

Trees are fun to play in but we have many other uses. Some trees are cut down to make wood for houses, boats and other things. How many things can you think of that are made out of wood? Then there are trees like me that are not used for wood but produce fruit. I'm an apple tree and I produce apples.

Well, I really enjoyed talking to you and hope that you've learned a lot about trees. Are there any questions?

Plants/Classification
Measuring/Estimating
8-10/Individual

# SIZE IT UP

Objective: The student will be able to classify plants according to size; a range from microscopic plants to trees.

Materials:

1. 4 - 8" x 10" pieces of tagboard
2. 4 book pockets (obtained from library)
3. Using the materials listed above make the SIZE IT UP sorting device as follows:
   a. Write words and draw pictures as illustrated on next page.
   b. Tape together (horizontally) the four pieces of tagboard.
   c. Glue book pockets on the lower left hand corner of each sheet (on the opposite side of tape). See illustration on next page.
4. Write the names of the following plants on 2" x 4" strips of paper or 3" x 5" index cards.

| | | | |
|---|---|---|---|
| daisy | dandelion | cornstalk | pine |
| rose | philodendron | wheat | box elder |
| grass | chrysanthemum | oak | |
| ivy | sunflower | maple | |
| carnation | alfalfa | poplar | |

Procedures:

1. The student takes a slip of paper and classifies what size the plant is by putting it in the proper book pocket.

Indication of Mastery: Classification of plant size with 80% accuracy.

Variations and Extensions

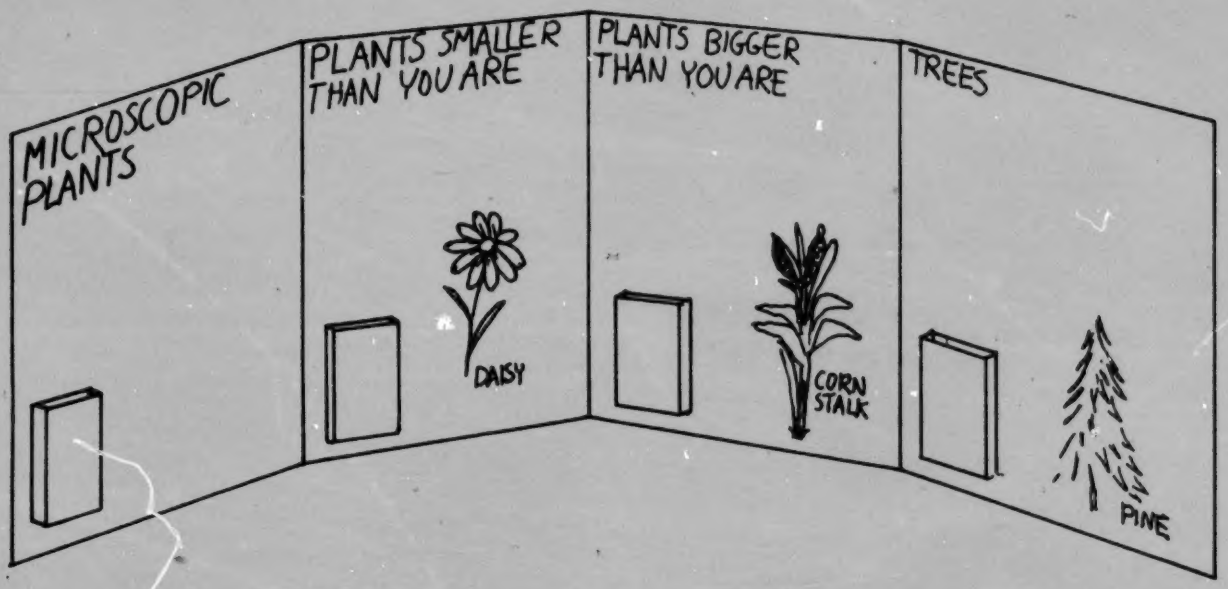
1. Use as a worksheet for a classification activity.
2. Use pictures of plants instead of or along with names of plants.

Interest Span: 15-20 minutes

Related Subject Areas: Reading

Practical Hints: Laminate sorting device and paper slips and make sure students understand size representations.

## SIZE IT UP: SORTING DEVICE



# PLANT PARK GAME

Objective: The student will be able to classify plants according to those that reproduce from seeds and those that do not.

Materials:

1. Plant Park game board (see next page).
2. 36 Plant Park game cards constructed as follows:
   a. Cut 36-3" x 3" cards.
   b. Print one of each of the following on the cards. If there is a number before any of the items, there should be that many of that item printed on cards.

      (5) move one plant that only reproduces by seeds
      (5) move one plant that reproduces by not using seeds
      (5) move two plants that only reproduce by seeds
      (5) move two plants that reproduces by not using seeds
      (5) move back one plant that only reproduces by seeds
      (5) move back one plant that reproduces by not using seeds
      (3) skip a turn
      (3) draw another card
3. Plant Park Answer Key (see next page).

Procedures:

1. 3 or 4 children sit in a small group around game board. The cards are placed face-down on spot indicated on game board.
2. The first player draws a card from pile and follows instructions on card and places card face-up on a discard pile.
3. The play continues counter-clockwise until one person reaches the finish mark. This person is the winner. If the card pile is used up, the discard pile is shuffled and the cards are used over.
4. The answer key is used to solve any arguments.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use Plant Park cards to classify plants into those that usually reproduce by seeds and those that do not.

Interest Span: 15-20 minutes

Related Subject Areas: Reading

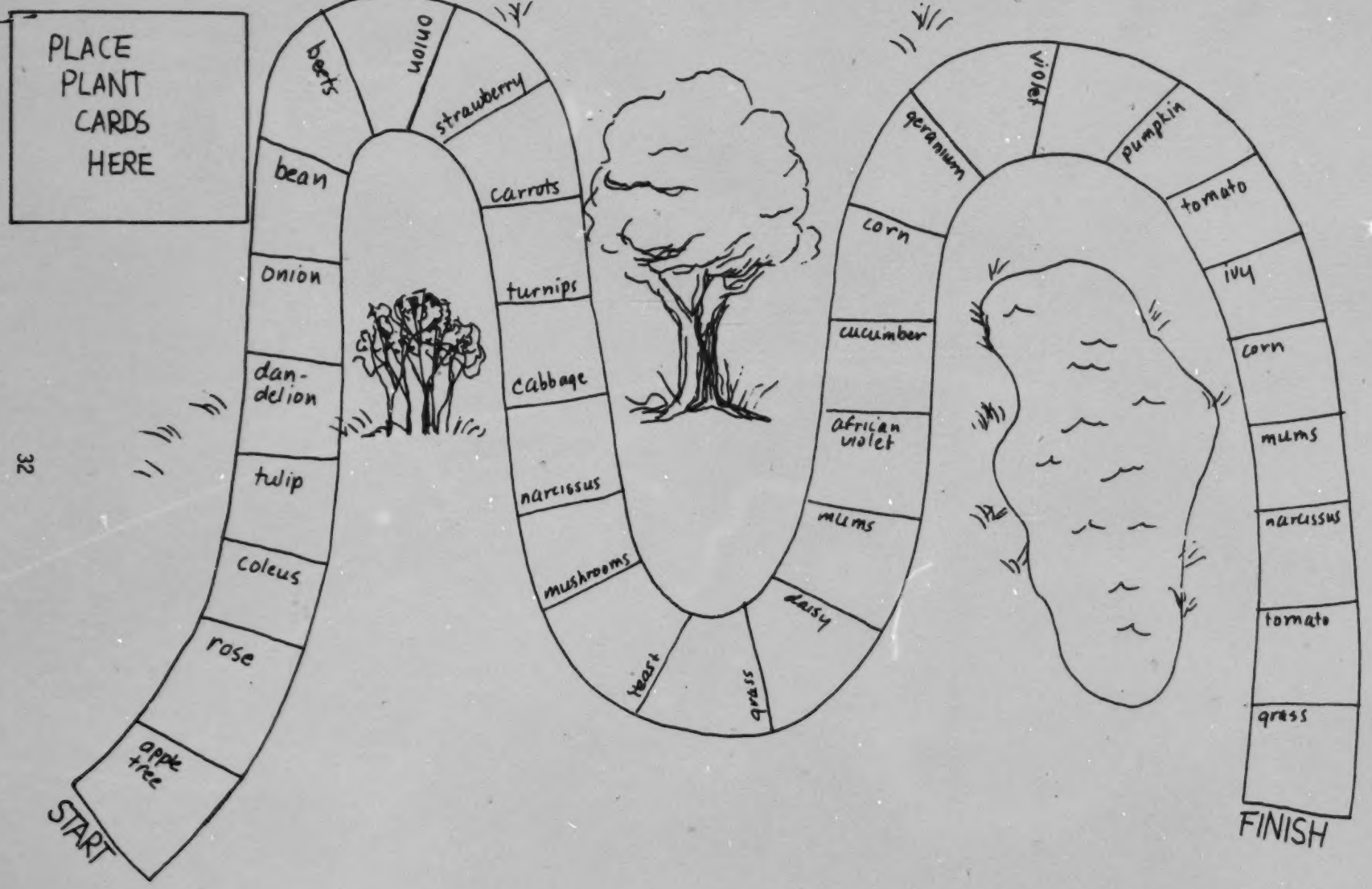
Practical Hints:

1. Laminate cards and game board for durability.

PLANT-PARK ANSWER KEY

| Plants that Reproduce Only by Seeds | Plants that Usually Reproduce Without Seeds |
|---|---|
| apple tree | coleus |
| rose | tulip |
| dandelion | onion |
| bean | strawberry |
| beets | narcissus |
| carrots | mushrooms |
| turnips | yeast |
| cabbage | African violet |
| grass | geranium |
| daisy | violet |
| mums | ivy |
| cucumbers | |
| corn | |
| tomato | |
| pumpkin | |

# PLANT PARK GAMEBOARD



# GREENHOUSE GAME

**Objective:** The student will be able to classify plants according to those that have chlorophyll and those that do not.

**Materials:**

1. The Greenhouse Game board (see next page).
2. Plant cards. The cards should be the same size as the sections on the greenhouse and should name one of each of the following plants:

| With Chlorphyll | | Without Chlorphyll |
|---|---|---|
| carnation | corn | mushroom (3 of these) |
| dandelion | bean | mold (3 of these) |
| celery | orchid | yeast (3 of these) |
| carrots | grass | shelf fungi (3 of these) |
| daisy | fern | bacteria (3 of these) |
| rose | pine | |
| elm | willow | |
| evergreen | coleus | |

3. Greenhouse Answer Key (Plants as listed above in number 2).

**Procedures:**

1. A small group of 3 or 4 children sits in a circle around the game board. The cards are placed face-down in a pile by the game board.
2. The first player draws a card. If it is a plant with chlorophyll he/she may place it in the greenhouse. If it isn't, he/she has to keep the card.
3. The play continues counter-clockwise until all the cards are gone or the greenhouse is full. At that point the person with the least amount of cards is the winner. The game may end with 2 winners.

**Indication of Mastery:** Participation in activity.

**Variations and Extensions:**

1. Have students classify the plant cards into two boxes; one labeled with chlorophyll, the other labeled without chlorophyll.

**Interest Span:** 15-20 minutes

**Related Subject Areas:** Reading

**Practical Hints:**

1. Laminate game board and cards for durability.

## SAMPLE GREENHOUSE GAMEBOARD

# LEAF RUBBING

Objective: The student will be able to identify what chlorophyll is, how plants make their own food and where the plant stores food.

Materials:

1. White paper
2. Crayons
3. Different types of leaves, at least one per student.

Procedures:

1. Distribute one leaf, paper, and crayons to each student.
2. Have students make a leaf rubbing by placing the paper over the leaf upside down and rubbing the crayon over it.
3. When the leaf rubbing is complete the student should draw arrows to show the path of food production in a plant.

Indication of Mastery: Completion of at least 5 different leaf rubbings.

Variations and Extensions:

1. Students could collect their own leaves in the fall and describe the plant they got them from.

Interest Span: 30 minutes

Related Subject Areas: Art, Language Arts

Practical Hints:

1. Leaf rubbings will work best if a little pressure is applied on the crayon.

# FUN WITH FUNGI

Objective(s): The student will be able to identify non-greenplants and describe how they obtain energy.

The student will give examples of how non-green plants are used by man and other animals.

Materials:

1. Fun with Fungi picture cards (see next page). Make 1 mushroom card, 3 mold cards, 1 yeast card, and 4 bacteria cards.
2. Type each of the 9 items (from answer key on next page) on cards the same size as the picture cards.
3. Fun with Fungi Answer Key (see next page)

Procedures:

1. Discuss non-green plants and how they obtain energy.
2. A small group of children puts the 18 cards face-down in six rows, 3 in each row.
3. The first player turns up two cards. If they match (a type of fungi and its use) they may keep the two cards. If not the cards are turned back, the next player takes a turn,
4. A player may keep playing as long as he/she keeps turning up matches.
5. Play continues counter-clockwise until all cards are gone.
6. The player with the most cards wins.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use cards as an individual station.

Interest Span: 20-30 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate cards for durability.

## FUN WITH FUNGI CARDS AND ANSWER KEY

mushroom - used for food

mold-used to make penicillin, a medicine
mold-used to flavor cheese
mold-helps break up dead plants and animals

yeast-helps make bread rise

bacteria-puts nitrogen in the soil
bacteria-food for tiny animals
bacteria-helps plants decay, which makes the soil richer
bacteria-some types put flavor in foods

# HOW DOES YOUR GARDEN GROW?

Objective: The student will be able to explain why plants survive in nearly every type of climate.

Materials:

1. A table or area of the floor covered with newspaper.
2. Bag of soil, some stones and sand.
3. Four types of seeds or plants. Good examples to use are beans, potatoes, tomatoes, and sunflower seeds.
4. Containers for planting. Egg cartons or margarine tubs work well.

Procedures:

1. Divide the class into four groups.
2. Give each group a different type of seed or plant.
3. Have the children prepare the containers for planting by filling them 3/4. full with soil. Two containers should be filled with sand or stones.
4. Have each group plant their particular seed in the containers according to directions on seed package.
5. Have each group label their containers.
6. Place one plant from each group in the following environments:
   Under a light bulb
   In Sunlight
   In a dark corner or closet
   Play music to one group daily
   Yell at one group daily
   Talk to one group daily
   (The plants which were planted in stones or sand should be given direct sunlight)
7. Each group is responsible for taking care of their plants. Keep a chart of the plants' progress. (See sample)
8. Compare results of each group.

Indication of Mastery: Participation in group and completion of chart.

Variations and Extensions:

1. Students could experiment with several environments at once
   Example: Play music and put in a dark corner.

Interest Span: 2-3 weeks

Related Subject Area:

Practical Hints:

1. Assign specific jobs for each group member to avoid confusion.
2. There should be no more than 4-5 students in each group.

## SAMPLE CHART

### GROUP 1-TOMATO PLANTS-OBSERVATIONS

| Date | Artificial Light | Sunlight | Darkness | Music | Talking | Yelling | Sand |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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# WHO NEEDS WEEDS GAME

**Objective:** The student will be able to describe plant competitors and how they can be controlled.

**Materials:**

1. "Who Needs Weeds" Card Deck which can be constructed as follows:
   1. Cut 15, 5" x 3" pieces of tagboard
   2. Print one of the following on each card:
      a. rust
      b. smut
      c. mildew
      d. mold
      e. weeds
      f. weakens stem of wheat
      g. destroys ears of corn
      h. grows on damp clothes and towels
      i. grows on old food
      j. any plant that robs other plants of space, water and/or sunlight
      k. controlled by chemicals or removing diseased plants
      l. controlled by chemicals
      m. controlled by keeping foods free from moisture
      n. eat foods while fresh
      o. controlled by machines, chemicals, or burning
2. Answer Key - See next page
3. Paper and pencil for scoring

**Procedures:**

1. Six students sit in a circle. One student serves as a leader and holds the answer key.
2. The leader deals the entire deck so each of the five remaining children has 3 cards.
3. The purpose of the game is for a child to be the first one to get a "run". A "run" consists of 3 cards--a plant competitor, what it does, and how it is controlled. This is done by each person deciding which card he/she does not want and passing it to the player on his/her right. All players pass when the leader says "Pass". The leader keeps saying "pass" (with short intervals in-between to give players time to think) until one child has a "run". This child puts his/her finger on his/her nose. The other children do the same; the last one to do so is the loser and receives a "W" on his/her space on the score card.
4. Each round is played the same as round one. If player loses a second time, he/she gets an "E" added to his/her score. If another player loses, he/she gets a "W" on his/her score. The third time an individual loses, he/she gets another "E"; the fourth time a "D" is added. They have spelled the word WEED.
5. More rounds are played the same as the first two. The object of the game is not to get letters added to your score. If a player loses for the fourth time, he/she has spelled the word "WEED" and has lost the entire game.

Procedures:

6. The judge checks the answer key after each round. A player can also get a letter added to his/her score in the same succession of letters in the above scoring, for having an incorrect "run".

Indication of Mastery: 100% identification of "runs"

Variations and Extensions:

1. Use the cards for an individual classification activty.

Interest Span: 30 to 40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Stress quietness and thinking during the "passing"of cards.

## ANSWER KEY

| | | |
|---|---|---|
| rust | - | (a, f, k) |
| smut | - | (b, g, l) |
| mildew | - | (c, h, m) |
| mold | - | (d, i, n) |
| weeds | - | (e, j, o) |

# PLANTBURGERS-WITH OR WITHOUT

Objective: The student will be able to classify green plants as to whether or not they have tubes for liquid conduction.

Materials:

1. Area of room or desk decorated and designated as a Plantburger stand. (Like McDonalds or Burger King)

2. Hamburger cards constructed as follows:

   A. Draw an outline of a hamburger on each card.

   B. On the top part of each hamburger, draw or paste on a picture of each of the following plants:

| | | |
|---|---|---|
| celery | maple tree | mushroom |
| coleus | rose | yeast |
| grass | potato | bacteria |
| sweet pea | peanut | shelf fungi |
| pine tree | mushroom | moss |
| oak tree | | algae |

3. Answer Key indicating each plant if it is with tubes for liquid conduction or without tubes for liquid conduction (see next page).

Procedures:

1. One student sits in or by hamburger stand and acts as salesperson. This person holds the answer key and "plantburger" pictures.

2. A student comes to the stand and asks for a plantburger. The salesperson asks whether he/she wants it "with" or "without" (meaning with or without tubes for liquid conduction). The customer gives his/her choice and names a plant that is an example of his/her choice.

3. If the customer gives a correct example, he/she receives that plantburger. If not, the salesperson says, "I'm sorry we are out of those."

4. Play continues until all students have a turn or the shop is out of "plantburgers".

5. If a customer gives a correct example, but that card is already taken, he/she gets another chance to name an example.

Indication of Mastery: Participation in activity.

PLANTBURGERS-WITH OR WITHOUT - cont.

Variations and Extensions:

1. Use cards for individual classification.
2. Play several times allowing different students to be the salesperson.

Interest Span: 30-40 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate Plantburger cards
2. Make sure children are very familiar with the plants and whether or not they have tubes for liquid conduction. Use other plants that you have studied if possible.

## SAMPLE PLANTBURGER CARD

Plantburger Answer Key

| With Tubes | Without Tubes |
|---|---|
| celery | mushroom |
| coleus | yeast |
| grass | bacteria |
| sweet pea | shelf fungi |
| pine tree | moss |
| oak tree | algae |
| maple tree | |
| rose | |
| potato | |
| peanut | |

30

# PLANT PUZZLE

Objective: The student will be able to classify the main functions of different parts of a plant: stem, roots, leaves.

Materials:

1. Copies of Plant Puzzle for each student's answers
2. Answer Key for Plant Puzzle
3. Pencils

Procedures:

1. Distribute a copy of the plant puzzle to each student.
2. Have students work individually to complete their puzzle.
3. When students have completed the puzzle they should check their answers with the answer key.

Indication of Mastery: Completion of Plant Puzzle with 100 percent accuracy.

Interest Span: 20 minutes

Related Subject Areas: Reading, Language Arts

Practical Hints:

1. This activity can be used as a review on completion of a unit on plants.

PLANT PUZZLE - cont.

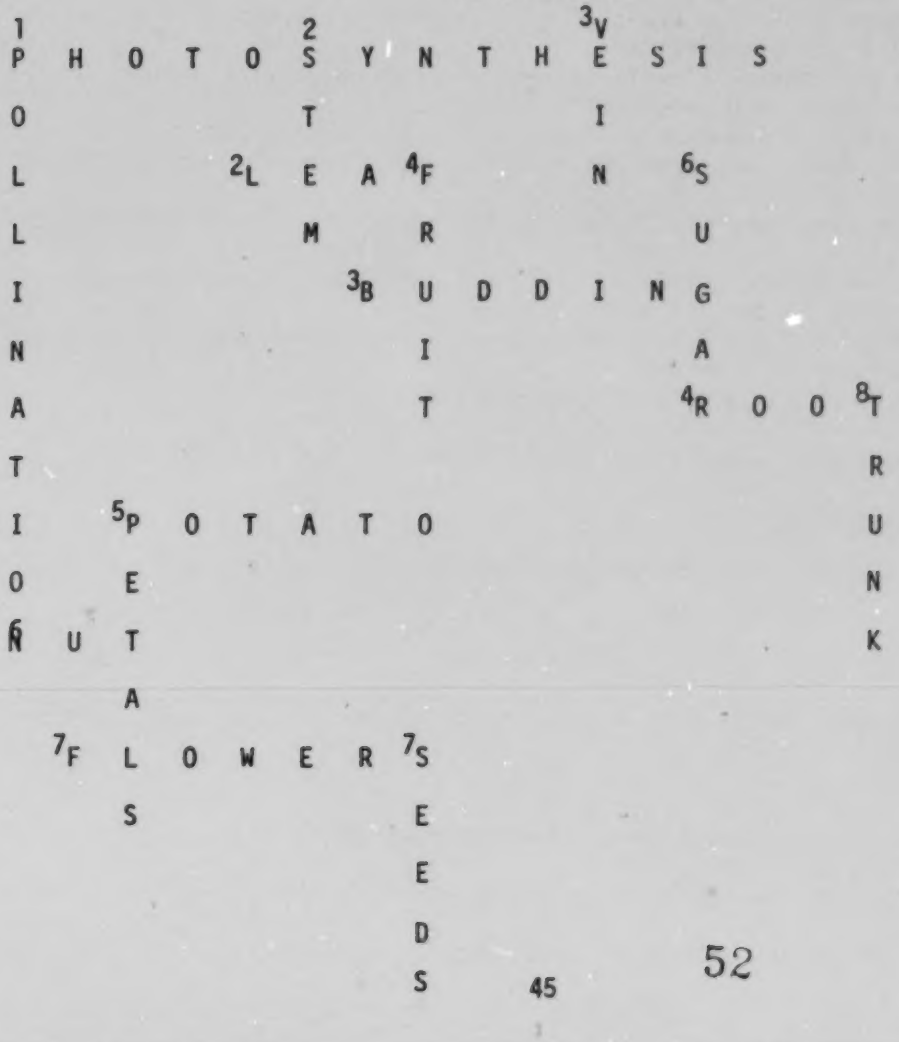
ACROSS

1. The food making process in green plants
2. Produce the food for the plant
3. The reproduction process in plants other than pollination
4. This part of the plant takes up water and minerals from the ground
5. An example of a stem which stores starch for the plant
6. A type of dry fruit which usually has only one seed
7. The function of this part of the plant is reproduction

DOWN

1. This reproduction process takes place on the flower of the plant.
2. The pipeline of the plant to and from the leaves and roots.
3. This part of the leaf takes the sugar made by the leaves to other parts of the plant.
4. This part is stored food of the plant which we can sometimes eat.
5. Colorful part of the flower.
6. The leaves of the plant produce this.
7. Plants form these for reproduction.
8. The stem of a tree.

ANSWER KEY



# FLOWER PULL APARTS

Objective: The student will be able to identify major parts and functions of a flower.

Materials:

1. Overhead projector.
2. Transparency of a diagram of the parts of a flower.
3. Several types of flowers, enough for each pair of students to have one.
4. Copies of the discovery chart for each pair of students.
5. Tape or glue.

Procedures:

1. Discuss with the entire class the parts and functions of a flower using the overhead projection and transparency.
2. Include a discussion of these points:
   1. Although different types of flowers look different they have some similar characterestics.
   2. Not all types of flowers have all of the parts discussed
3. Divide the class into groups of 2 students.
4. Give each pair of students a flower and 1 discovery chart.
5. Have the students work together with their partners to complete the following tasks:
   1. Draw a diagram of the flower at the top of the chart and label the parts.
   2. Take the flower apart and identify each part. Attach the parts to the chart in the appropriate space.
   3. Complete the chart by briefly describing the functions of each part in the spaces provided.
6. Have each group compare their findings with the class.

Illustration of Mastery: Each group should correctly complete the chart.

Variations and Extensions:

1. Students might collect their own flowers on a nature walk and identify the flowers in the activity.

Interest Span: 30-40 minutes

Related Subject Area: Art

Practical Hints:

1 Flowers can be obtained from a flower shop if they are slightly damaged for little or no cost.
2. Transparency can be easily made by hand or is available from thermo-fax copy books.
3. In place of a transparency a flannel board can be used.

## SAMPLE CHART

Names of Students: _____

Names of Flower: _____

Diagram of flower

| Name | Sample part | Function |
|---|---|---|
| Pistil | | |
| Anther | | |
| Stamen | | |
| Sepal | | |
| Petal | | |

# PLANT PRINTS

Objective: The student will be able to identify the relationship between flower, fruit, and seed.

Materials:

1. Fruits and vegetables which can be used for printing should be brought in by students. Examples which can be used are: apples, carrots, oranges, grapefruit, potatoes and strawberries.
2. Tempera prints of various colors
3. Large sheets of construction paper
4. Brushes, cans of water and newspapers

Procedures:

1. Cover tables with newspaper and distribute paper and supplies to students.
2. Cut each student's fruit in half to make a cross-section.
3. Have the students place their fruit in an appropriate color paint and print it on the paper.
4. Have each student finish the print by adding the seed and flower to the picture. The real seeds can be pasted on or they can be drawn in the appropriate places.
5. Label the parts of the total plant: seed, flower, and fruit.

Indication of Mastery: Completion of picture.

Variations and Extensions:

1. Other materials can be used to depict the flower or seed of each plant. For example, cotton could be used as apple blossoms.

Interest Span: 30 minutes

Related Subject Areas: Art

Practical Hints: Be sure the students clean up after working with the materials.

Plants/Making Operational Definitions,Communication
10-12/Small Group

# SPIN-A-PLANT

Objective: The student will be able to describe ways in which green plants reproduce.

Materials:

1. 6 x 5 inch pictures of the following plants: (See next page for illustrations)

   1. apple blossoms
   2. rose
   3. geranium
   4. poppy
   5. daisy
   6. onion
   7. tulip
   8. crocus
   9. gladiolus
   10. iris
   11. potato
   12. strawberry
   13. philodendron
   14. ivy
   15. coleus

2. Pop bottle

3. Answer card listing the plant, name of type of reproduction, and brief definition of reproduction process. (See next page)

Procedures:

1. 3 or 4 children place all 15 picture cards in a large circle on the floor. The pop bottle should be placed in the center of the circle.

2. One child is selected as the judge and holds the answer card.

3. The first player spins the bottle and picks up the card the bottle points to. He/She then names the plant's type of reproduction and gives a simple definition of that process.

4. The judge verifies the answer, and if it is correct, the child keeps the card. If it is incorrect, the card is placed back in the circle.

5. Play continues clockwise until all cards are gone.

6. The person with the most cards is the winner.

Indication of Mastery: Participation in activity.

Variations and Extensions: Let a different child be the judge each time the game is played.

Interest Span: 30-40 minutes

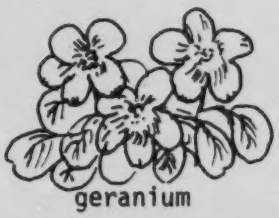
Related Subject Areas: Reading

Practical Hints: Laminate cards for durability.

## SPIN-A-PLANT ANSWER CHART

| Plant | Type of Reproduction | Definition of Reproduction |
|---|---|---|
| apple blossoms | seed-producing | after pollination plant produces a seed which will grow into a new plant |
| rose | seed-producing | after pollination plant produces a seed which will grow into a new plant |
| geranium | seed-producing | after pollination plant produces a seed which will grow into a new plant. |
| poppy | seed-producing | after pollination plant produces a seed which will grow into a new plant |
| daisy | seed-producing | after pollination plant produces a seed which will grow into a new plant |
| onion | by a bulb | bulb is really a bud which will grow into a plant |
| tulip | by a bulb | bulb is really a bud which will grow into a plant |
| crocuses | by a corm | corm of plant grows into a new plant |
| gladiouluses | by a corm | corm of plant grows into a new plant |
| iris | using rhizomes | food stored at end of rhizomes and new plants grow from here |
| potato | using rhizomes | food stored at end of rhizomes and new plants grow from here |
| strawberry | using a runner | runner comes from stem and on certain places a plant grows |
| philodendron | by a cutting | someone cuts a piece of plant, puts it in water and it grows roots |
| ivy | by a cutting | someone cuts a piece of plant, puts it in water and it grows roots |
| coleus | by a cutting | someone cuts a piece of plant, puts it in water and it grows roots |

## SPIN-A-PLANT PICTURES

| | | |
|---|---|---|
| apple blossoms | rose |  geranium |
| poppy | daisy | onion |
| tulip | crocuses | gladioluses |
| iris | potato | strawberry |
| philodendron | ivy | coleus |

# QUESTION QUIZ!

Objective: The student will be able to describe and identify simple and complex plants and how they are used.

Materials:

1. Two small bells
2. Pencil and paper for score card
3. Plant answer and question list (see next page)

Procedure:

1. Three children play. Two of the children take a bell and the other takes the plant answer and question list.
2. The person with the list reads an answer. The first person that can formulate a question for the answer rings his/her bell. He/She then says the question and if the reader ok's the question he/she is awarded a point. If the question is wrong the other players get a chance to formulate a question. He/She gets a point only if the question is correct.
3. Play continues until the entire answer list is read. The person with the most points at that time is the winner.

Indication of Mastery: Formulation of questions with 80% accuracy.

Variations and Extensions:

1. Use the answers and questions for a matching activity on a worksheet.
2. Play the game three times to give each child a chance to be the leader.

Interest Span: 30-40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Make sure children are familiar with the plants.

QUESTION QUIZ - cont.

## SAMPLE ANSWERS AND QUESTIONS

| Answer | Question |
|---|---|
| A seed producing plant used for a type of food. | What is a sunflower? |
| A runner-type plant that produces a fruit. | What is a strawberry? |
| A house plant reproduced by a cutting. | What is a philodendron?<br>What is an ivy?<br>What is a coleus?<br>(might be other anwers) |
| Plant that is used for a vegetable and the eyes grow to produce new plants. | What is a potato plant? |

# HELPFUL PLANTS

Objective: The student will be able to describe the process of how oxygen comes from green plants.

Materials:

1. Leafy elodea plants
2. Shallow wide mouth jars
3. Test tubes
4. Water
5. Plastic wrap and aluminum foil

Procedures:

1. Divide the group into teams of four students each. (Groups may vary because of the availability of materials and the number of participants in each group.
2. Give each team elodea stems and have them place the stems in the test tube.
3. Fill each test tube with water and carefully invert each test tube into a jar of water. This can be accomplished by placing a thumb or a piece of plastic wrap over the open end of each test tube and releasing the object when the mouth of the test tube is underwater.
4. Have each group make one test tube of aluminum foil and slip it over one of the test tubes in the water.
5. Place the container of water with the two test tubes in direct sunlight.
6. Have each group or team form a hypothesis and record the predictions.
7. Have each group or team observe and record the data.
8. After three days, have the groups or teams uncover the test tube of foil.
9. Discuss the data collected by each group or team.

Indication of Mastery: Completion of the experiment, recording of data and communicating the results.

Variations and Extensions:

1. May use just one test tube to demonstrate the release of oxygen.

Interest Span: 2-3 days

Related Subject Area: Language Arts

Practical Hints:

1. Place the cut end of the stem at the bottom of the tube.
2. Place the container of water indirect sunlight before inverting the test tube.
3. Set specific procedures of the experiment.

# AMAZING ANIMALS

# ANIMALS

| Age Level | Objectives | Activity Title | Page |
|---|---|---|---|
| 5-8 | The student will be able to: | | |
| | 1. describe the major characteristics of animals (eg. eating, growing or changing, moving, reproducing) | ANIMAL QUIZ | 57 |
| | 2. classify living things as animal or non-animal and identify animal names. | HIDDEN ANIMALS | 59 |
| | | ANIMALS IN ALPHABET PARADE | 61 |
| | 3. identify the basic needs of animals. | ZOOY SQUARES | 62 |
| | 4. describe growth in different kinds of animals. | KNOWING GROWING GAME | 64 |
| | 5. identify food selectivity for animals. | ZOOY DIETICIAN | 65 |
| | | WHO'S COMING FOR DINNER | 66 |
| | 6. name two distinguishing characteristics of each of the classes of vertebrates: amphibians, birds, fish, mammals, reptiles. | POCKET-AN-ANIMAL | 67 |
| | 7. classify common vertebrates into the following classes: amphibians, birds, fish, mammals, reptiles. | ANIMAL PUZZLE MATCH-UPS | 68 |
| | 8. be aware that there are two different kinds of animals--vertebrates and invertebrates. | FEEL AN ANIMAL | 70 |
| | 9. tell how animals adapt to seasonal changes. | WINTER HOMES | 71 |
| | 10. identify the young of animals. | ANIMAL BABYLAND | 74 |
| 8-10 | 11. identify the names of animals. | MIXED-UP ANIMALS | 76 |
| | | CAMOUFLAGED CREATURES | 78 |
| | 12. identify animals as invertebrates and vertebrates. | DOMINOED ANIMALS | 80 |
| | 13. list the five classes of vertebrates and classify vertebrates into these classes. | THE ANIMAL SCHOOL | 82 |
| | 14. list the needs of all animals for survival (eg. food, air, and water), and how they meet these needs. | HOW FIVE STAY ALIVE GAME | 84 |
| | 15. recognize and identify life cycle stages. | FROM BEGINNING TO END! | 86 |
| | 16. distinguish between animals which bear their young alive and animals which lay eggs. | HATCHING EGGS | 87 |

| Age Level | Objectives | Activity Title | Page |
|---|---|---|---|
| 8-10 cont. | 17. identify ways in which animals adapt to various communities. | ANIMAL COMMUNITIES | 88 |
| 10-12 | 18. classify animals into general categories--vertebrates and invertebrates. | GO TO THE ZOO! | 89 |
| | 19. classify vertebrates into classes: amphibians, birds, fish, mammals, reptiles. | ANIMAL GRAPH | 91 |
| | | I DON'T BELONG HERE--#1 | 93 |
| | 20. identify the main parts of animals especially those parts that determine class. | PICK-A-PART | 95 |
| | 21. describe ways in which animals reproduce. | REPRODUCTION RIDDLES | 97 |
| | 22. identify the life supporting needs of specified animals. | WHAT DO I NEED GAME | 99 |
| | 23. identify human actions that cause animals to become extinct and identify animals that are extinct or species that are in danger of becoming extinct. | EXTINCTION CONCENTRATION | 101 |
| | 24. describe simple animals, telling how they benefit and hinder man. | THE MINI-ZOO | 103 |
| | 25. construct an aquarium. | LET'S MAKE AN AQUARIUM | 105 |
| | 26. identify five major classes of invertebrates. | I DON'T BELONG HERE--#2 | 106 |
| | 27. use classification as a tool for studying animals. | WATERY CREATURES | 108 |

# ANIMAL QUIZ

Animals/Communicating
Interpreting Data
5-8/Small group

Objective: The student will be able to describe the major characteristics of animals. (e.g. eating, growing or changing, moving, reproducing)

Materials:

1. 20-3" x 5" picture cards. Each of the following cards should have a picture and corresponding name of one of each of the following: (See example on next page.)

| | | | |
|---|---|---|---|
| rock | door | person | snake |
| flower | house | dog | spider |
| tree | sun | cat | bee |
| lake | car | squirrel | butterfly |
| chair | train | frog | turtle |

2. One copy of "Animal Quiz Chart", as shown on next page, for each student participating.

Procedures:

1. A small group of children sit in a circle. Each has an Animal Quiz Chart and the cards are placed face-down in center of circle.

2. The first player draws a card. He/she determines if it is an animal by looking at the Animal Quiz Chart. It is an animal if all 4 items; eats, grows or changes, moves, and has children, are checked. If any one of these boxes are not checked it is not an animal.

3. Correct identification of animals results in keeping the card. Incorrect identification results in putting the card at bottom of pile.

4. Play continues counter-clockwise until all cards are gone. Player with the most cards wins.

Indication of Mastery: Participation in activity.

Variations and Extensions:

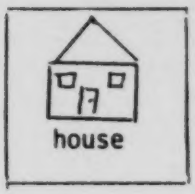
1. Give children blank charts and have them fill it in according to what they know about the objects.

Interest Span: 15-20 minutes

Related Subject Areas: Math

Practical Hints:

1. Laminate cards and charts for durability.




SAMPLE ANIMAL QUIZ CARD

## ANIMAL QUIZ CHART

| Animal | Eats | Grows or/ Changes Form | Moves | Reproduces Itself or/ Has Children |
|---|---|---|---|---|
| rock | | | | |
| flower | X | X | | X |
| person | X | X | X | X |
| tree | X | X | | X |
| dog | X | X | X | X |
| cat | X | X | X | X |
| lake | | | | |
| chair | | | | |
| squirrel | X | X | X | X |
| frog | X | X | X | X |
| snake | X | X | X | X |
| door | | | X | |
| house | | | | |
| spider | X | X | X | X |
| bee | X | X | X | X |
| sun | | X | | |
| car | | | X | |
| butterfly | X | X | X | X |
| train | | | X | |
| turtle | X | X | X | X |

# HIDDEN ANIMALS

Objective: The student will be able to classify living things as animal or non-animal and identify animal names.

Materials:

1. Laminated activity card.
2. Marking pen.

Procedures:

1. Six words are hidden in the scrambled letters.
2. Students are to circle all of the words that represent animals.
3. Students check their answers on the back of the card.

Indication of Mastery (Evaluation, Checklist, Discussion):

This activity is self-checking; if the student gets 80% (5 out of 6) correct, he or she has mastered the activity.

Variations and Extensions (List Options):

1. Once you have circled the words, rewrite them for penmanship.
2. Draw pictures of the animals the words represent.

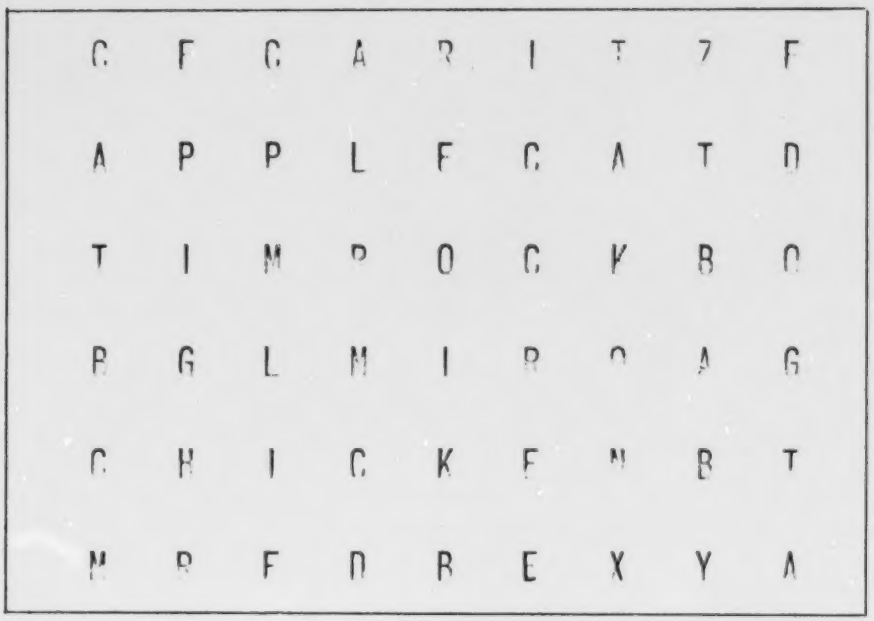
Interest Span: 10-15 minutes.

Related Subject Areas: Spelling, Penmanship, Fine Arts, Language Arts

Practical Hints:

1. Laminate activity card.
2. Crayon will work just as well as a marking pen.
3. Picture cards of the animal words in the scramble may be used to help the child think of the name.
4. Lower case letters may be used, or use both upper and lower case letters to practice manuscript recognition.

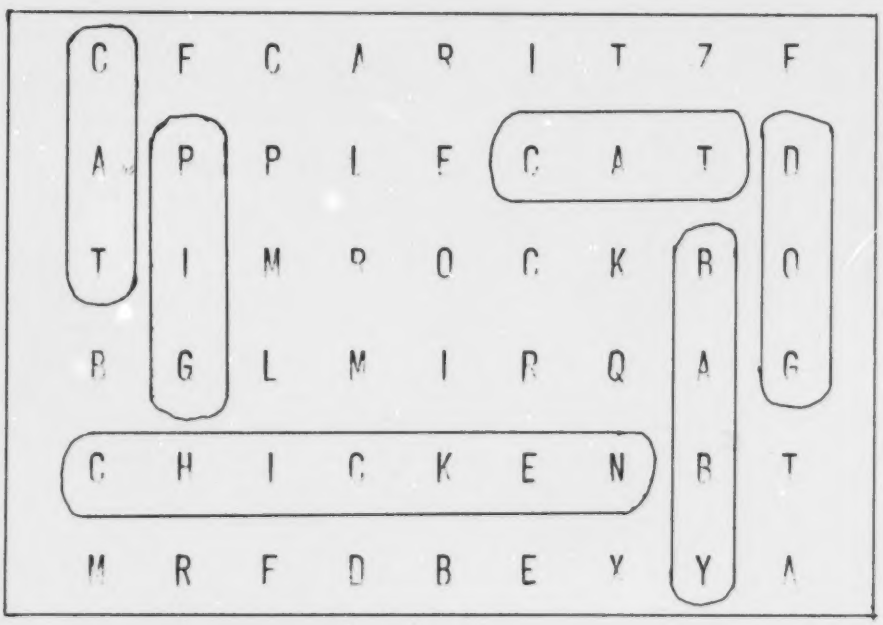
HIDDEN ANIMALS - cont.



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| C | F | C | A | R | I | T | 7 | F |
| A | P | P | L | F | C | A | T | D |
| T | I | M | R | O | C | K | B | O |
| B | G | L | M | I | R | Q | A | G |
| C | H | I | C | K | E | N | B | T |
| M | R | F | D | B | E | X | Y | A |

FRONT

Sample Card



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| C | F | C | A | R | I | T | 7 | F |
| A | P | P | I | F | C | A | T | D |
| T | I | M | R | O | C | K | B | O |
| B | G | L | M | I | R | Q | A | G |
| C | H | I | C | K | E | N | B | T |
| M | R | F | D | B | E | Y | Y | A |

BACK

Answer Card

# ANIMALS IN ALPHABET PARADE

Objective: The student will be able to classify living things as animals or non-animals and identify animal names.

Materials:

1. Large story paper.
2. Ring binders (for easy removal, shifting, and adding).
3. Paste.
4. Access to magazines and pictures of animals to be pasted.
5. Marking pen.

Procedures:

1. The students are asked to bring in magazines for the class.
2. The student looks for pictures of animals.
3. The student cuts out the animal picture, pastes it on the story paper and writes the name of the animal next to the animal picture.
4. The student puts the pictures in alphabetical order and may make a booklet.
5. The student should be encouraged to draw the picture of the animal he/she cannot locate to complete the booklet.

Indication of Mastery:

Agreement between the student and the teacher. (Probably at least one animal for each letter in the alphabet.)

Variations and Extensions (List Options):

1. This activity may be completed independently, in a small group, or with the whole class (e.g. 25 students) participating.
2. To reinforce vowels, for example, only the letters A, E, I, O, U and Y can be used.

Interest Span: Periods of 15-20 minutes over a two to three week span.

Related Subject Areas: Language, Fine Arts

Practical Hints: Let the students' drawings be very creative.

# ZOOY SQUARES

Animals/Communicating
5-8/Small group
(3 students)

Objective: The student will be able to identify the basic needs of animals.

Materials:

1. "Zooy Squares" Cards
2. "Zooy Squares" playing board

Procedures:

1. The three students decide who the referee will be. His/Her responsibility will be to read the questions to the players and tell the student whether he/she is correct or not.
2. The remaining two students decide who will be the "X" and who will be the "O".
3. Each student takes turns. If he/she answers the question correctly he/she places the symbol where he/she so chooses in a strategy to win the game. (See sample activity board.) If he/she answers the question incorrectly, he/she forfeits a turn.
4. The game ends when one player has a symbol on three squares in a row--horizontally, vertically, or diagonally, the same as in winning tic-tac-toe.

Indication of Mastery: Participation by the student.

Time Span: 20-25 Minutes

Related Subject Areas: Language arts

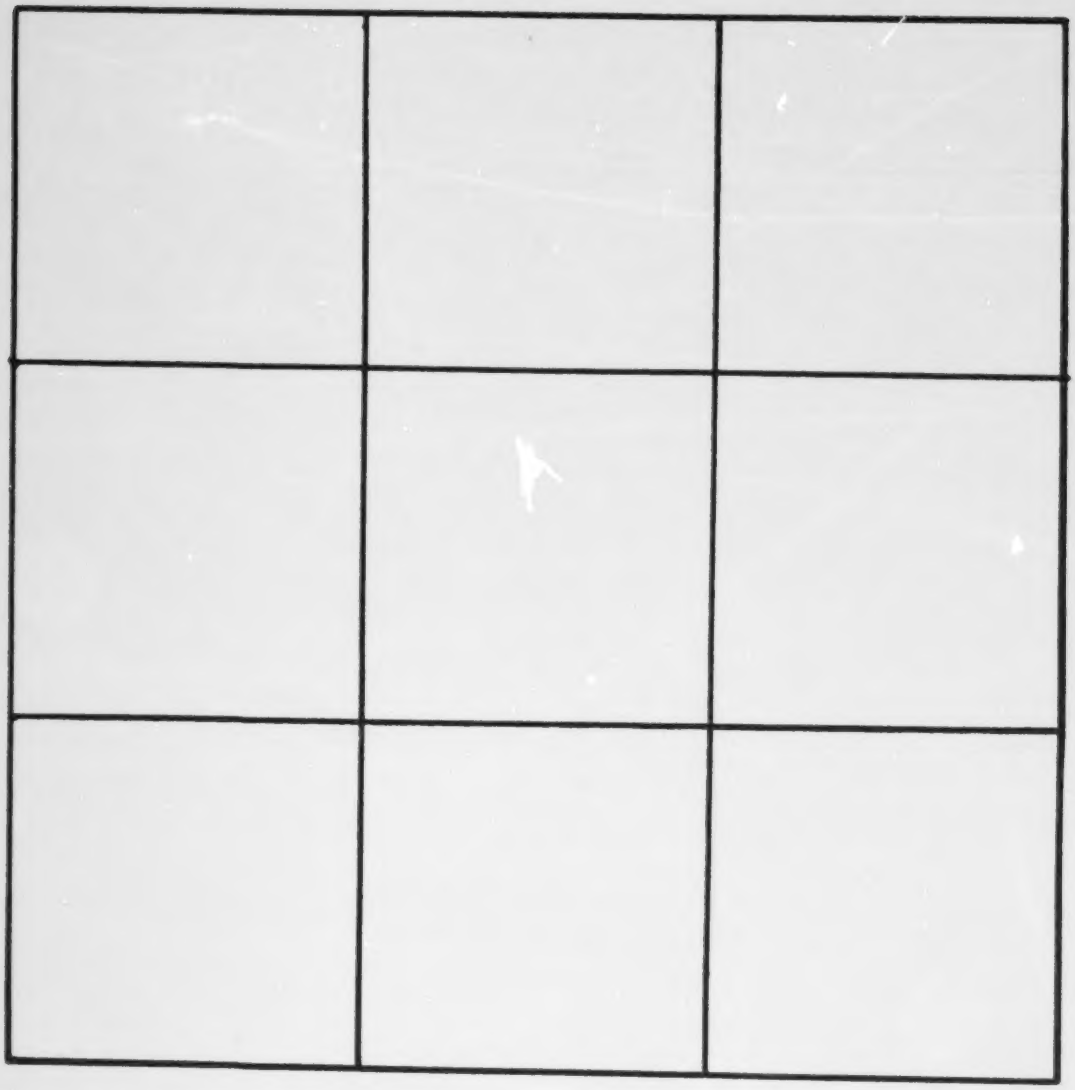
Practical Hints:

1. Instead of the students playing individually, they may play in groups of two or three students, deciding on one answer to be given from the spokesman from the group.

Starter List of Questions:

1. After being on a desert, why would a man go to a river?
2. Name one shelter of man.
3. Where do birds live?
4. Why do animals need food?

## "ZOOY SQUARES" ACTIVITY BOARD



SAMPLE QUESTION CARD

# KNOWING GROWING GAME

Animals/Formulating Models
5-8/Independent

Objective: The student will be able to describe growth in different kinds of animals.

Materials:

1. 16-3" x 3" "Knowing Growing" cards. Each card will include one of the following pictures:

| | |
|---|---|
| tadpole | frog |
| little boy | grown man |
| caterpillar | butterfly |
| baby chick | hen |
| calf | cow |
| kitten | cat |
| baby rabbit | grown rabbit |
| baby elephant | grown elephant |

Procedures:

1. Two to four players sit in a circle and lay out the cards so there are 4 rows with 4 cards in each row.
2. The first player turns two cards over. If there is a picture of an animal in its young and adult stage, it is a match and the player can keep the cards. The player then can take another turn and can keep taking turns as long as he/she keeps making matches. If the two cards are not a match, the cards are put back face-down in their places.
3. Play continues counter-clockwise until all cards are gone. The player with the most cards is the winner.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use as a station activity. Have child sort cards into two boxes; one labeled "adult" the other labeled "child."

Interest Span: 20-30 minutes

Related Subject Areas: Language Arts

Practical Hints: Laminate card deck for durability.

# ZOOY DIETICIANS

Objective: The student will be able to identify food selectivity for animals.

Materials:

1. IMC
2. Art materials for booklet

Procedures:

1. The student is a dietician at a very large zoo. His/Her jobs is to plan menus for the animals. The animals he/she has to feed are listed below:

   1. gorilla
   2. zebra
   3. snake
   4. ostrich
   5. monkey
   6. seal

2. Find out what these animals like to eat. Then draw a picture of the food you are going to serve the animals.

3. Present your information in a "Zooy Dietician" booklet.

Illustration of Mastery:

1. Teacher observation

2. Student participation

Time Span: 2 weeks

Related Subject Areas: Language arts, Fine arts

Practical Hints:

1. Use with a small group of students. The list of animals to be fed may be increased or decreased depending on the number of students.

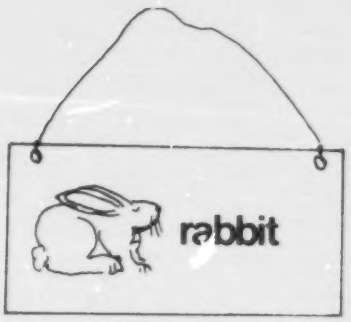
2. A play could be created by the students in the group to act out the feeding.

# WHO'S COMING FOR DINNER?

Objective: The student will be able to identify food selectivity for animals.

Materials:

1. A name tag for each student participating in the activity. Each tag should show a picture of one animal and they should all be different. A suggested example is drawn below.




Procedures:

1. Discuss animals and what they eat. Discuss plant-eating animals, animals that eat animals and animals that eat both plants and animals.
2. Have students put on animal name tags.
3. Say "Who's Coming for Dinner? I'm serving (plants) or (animals) or (plants and animals)." Have children who are wearing the appropriate tags come to the front and state their animal name and sit back down.
4. Repeat with each of the two remaining categories.
5. Have the children exchange name tags and repeat with all three categories.

Indication of Mastery: Participation in Activity.

Variations and Extensions:

1. Have individual students sort the name tags according to the three categories.

Interest Span: 15-20 minutes

Related Subject Areas: Language Arts

Practical Hints: Laminate tags for durability.

# POCKET-AN-ANIMAL

Objective: The student will be able to name two distinguishing characteristics of each of the classes of vertebrates--amphibians, birds, fish, mammals, and reptiles.

Materials:

1. Construct the Pocket-An-Animal sorting device as follows:
   a. Cut an 8-inch by two-foot piece of tagboard.
   b. Paste five book pockets on the bottom horizontal edge.
   c. Label each pocket with one of the following classes: birds, fish, amphibians, mammals, and reptiles. (See illustration below.)
2. 5 - 2"x3" cards each containing one of the following characteristics: feathers, smooth, moist skin, hair, scales, but not gills, fins; and 5 - 2"x3" cards, 2 containing "warm-blooded" and 3, "cold-blooded."

Procedures:

1. A child sorts the five characteristic cards according to the classes of animals on the book pockets. The student then sorts the "warm-blooded" and "cold-blooded" cards according to class.
2. The game can also be played by the child matching two characteristics to each each class of vertebrate class cards.

Indication of Mastery: Classification of cards with 100% accuracy.

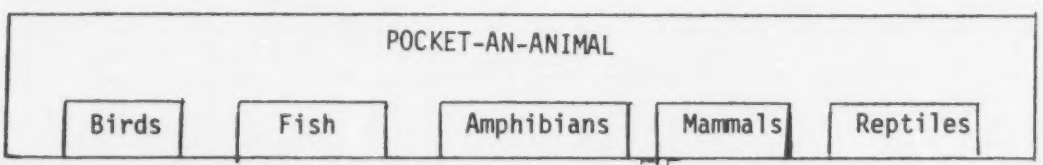
Variations and Extensions:

1. Mount pictures of 15-20 animals. Have the students sort them into classes according to their distinguishing characteristics.

Interest Span: 10 to 15 minutes

Related Subject Areas: Reading

Practical Hints: Laminate sorting device and cards for durability.



# ANIMAL PUZZLE MATCH-UPS

Objective: The student will be able to classify common vertebrates into the following classes: amphibians, birds, fish, mammals, reptiles.

Materials:

1. 2 sets of 15 animal puzzles which are constructed as follows:

   a. Cut out 30 pieces of tagboard 6" x 2".
   b. Cut pieces in half using a zigzag cut. Make sure all cuts are somewhat different. (See next page.)
   c. Draw an animal on one half of the cut piece of tagboard and the name of its class on the other half. Use the animals and classes listed below. Make 2 of each so you have 2 sets.

| | |
|---|---|
| trout - fish | woodpecker - bird |
| cow - mammal | frog - amphibian |
| rabbit - mammal | toad - amphibian |
| angel fish - fish | alligator - reptile |
| cat - mammal | snake - reptile |
| person - mammal | chicken - bird |
| robin - bird | duck - bird |
| blue jay - bird | |

2. Stopwatch

Procedures:

1. Give each pair of children a set of animal puzzles. When you say "Go", have them see who can be the first one to match all the pairs. Those children that know the class will be able to match faster.

2. Play again and time the children with the stopwatch.

Indication of Mastery: Participation in Activity.

Variations and Extensions:

1. Use matching activity as an independent learning station.

2. Keep a chart of how fast children are able to match puzzles. Have them try to improve their time.

Interest Span: 10 to 15 minutes

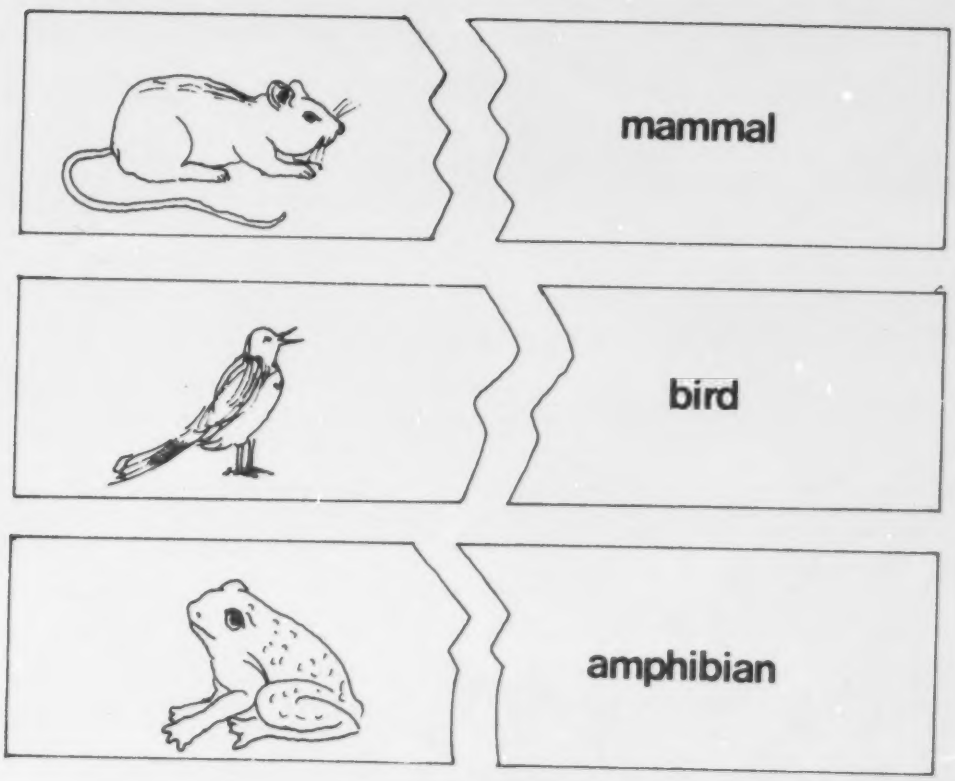
Related Subject Areas: Reading

ANIMAL PUZZLE MATCH-Ups-cont.

Practical Hints:

1. Laminate puzzles for durability.

SAMPLE MATCH-UP CARDS



# FEEL AN ANIMAL

Animals/Observing
Classification
5-8/Large group

Objective: The student will be aware that there are two different kinds of animals--vertebrates and invertebrates.

Materials:

1. 14 word cards, each 5" x 2". Each card should contain one of the following words: vertebrate, invertebrate, cat, hamster, rabbit, bird, fish, frog. starfish, sponge (real), grasshopper, ladybug, spider, crayfish, or crab.
2. A living or preserved example of each animal listed above.

Procedures:

1. Explain that invertebrates are animals that do not have a backbone; vertebrates are animals that have a backbone. Show the two word cards and mount them on a bulletin board or wall.
2. Bring in one animal a day and have one or two selected children feel the example for a backbone. Have them identify the animal as vertebrate or invertebrate.
3. Show the word card that corresponds with the animal for the day. Have a student mount the word card under the proper name "vertebrate or invertebrate."
4. Repeat each day with a different animal--each of the 12 listed in the materials section or make substitutions of animals similar to those named.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Repeat activity with other animals selected by you or the children.

Interest Span: 5 - 10 minutes a day.

Related Subject Areas: Reading

Practical Hints:

1. Emphasize the care in handling live animals.

Animals/Classification
Making Operational Definitions
5-8/Small group

# WINTER HOMES

Objective: The student will be able to tell how animals adapt to seasonal changes.

Materials:

1. 10-3" x 5" picture and word cards as shown on the following page.
2. Winter Homes Answer Key.

Procedures:

1. A teacher (or other adult) and a small group of children sit in a circle. The cards are placed face-down in the center and the adult holds the answer key.
2. The player to right of the adult draws a card. He/she identifies the animal and in his/her own words defines what happens to the animal during the winter.
3. If correct, the player can keep the card. If not, the card is put at the bottom of the pile.
4. Play continues counter-clockwise until all cards are gone.
5. Player with the most cards wins.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use as a drill activity for one child.

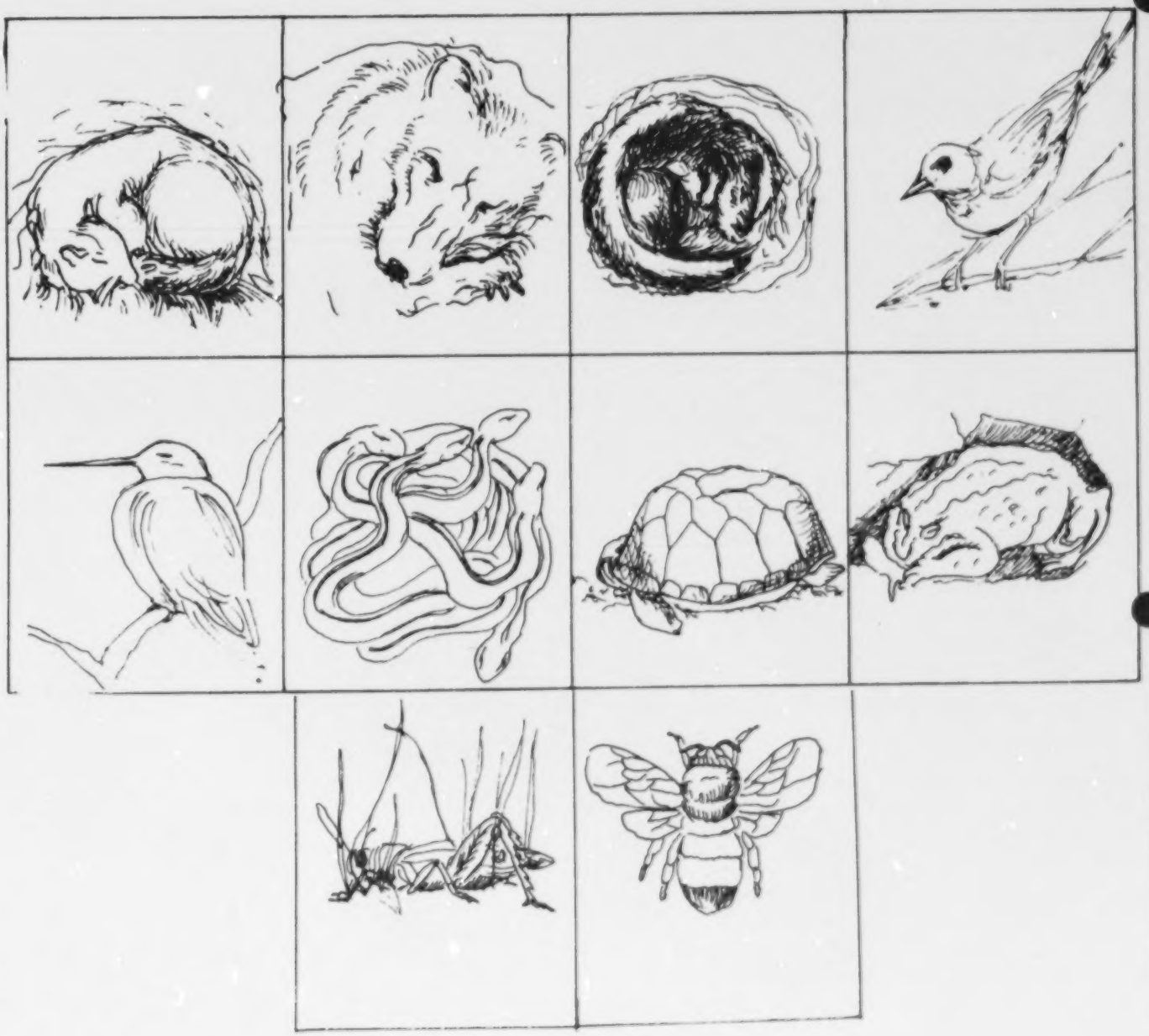
Interest Span: 10-15 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate picture cards and answer key for durability.

## WINTER HOMES PICTURE CARDS



# WINTER HOMES ANSWER KEY

| Animal | What Happens In Winter |
|---|---|
| squirrel | grows a winter coat, gets fat, sleeps in a den for winter |
| bear | gets fat, grows more fur, sleeps for winter |
| skunk | gets fat, sleeps for winter |
| robin | flies to warmer temperatures for winter |
| hummingbird | flies to warmer temperatures for winter |
| snake | crawls into cracks in rocks underground, sleeps for winter |
| turtle | sleeps in a hole underground |
| toad | sleeps underground for winter |
| grasshopper | dies before winter |
| bee | all die before winter except the queen bee who sleeps in a mossy area (or an old hive) |

# ANIMAL BABYLAND

Objective: The student will be able to identify the young of animals.

Materials:

1. Activity card with various pictures of adult and baby animals with a space to match the adult or baby card.
2. Individual animal cards to put in spaces on activity cards.

Procedures:

1. The student is to match the animal's baby to the adult or the adult to the baby.
2. The activity is self-checking as answers are on the back of the card.

Indication of Mastery: If the student gets 80 percent correct, he/she has mastered the activity.

Variations and Extensions:

1. Pictures can be matched with the word of the animal (for example, puppy to dog picture ) independently or at a learning station.
2. This activity can be completed in a small group.
3. Just the baby picture card can be shown and the student is to guess the adult name.

Interest Span: 15-25 minutes.

Related Subject Areas: Language Arts.

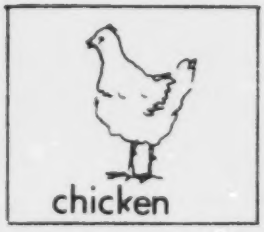
Practical Hints:

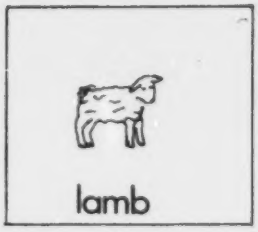
1. Laminate cards.

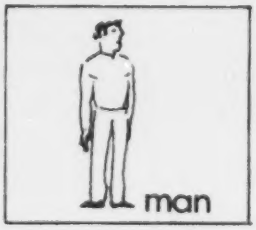
Starter List:

1. Cat-kitten
2. Dog-puppy
3. Man-baby
4. Horse-colt
5. Frog-tadpole
6. Duck-duckling
7. Chicken-chick
8. Sheep-lamb
9. Cow-calf

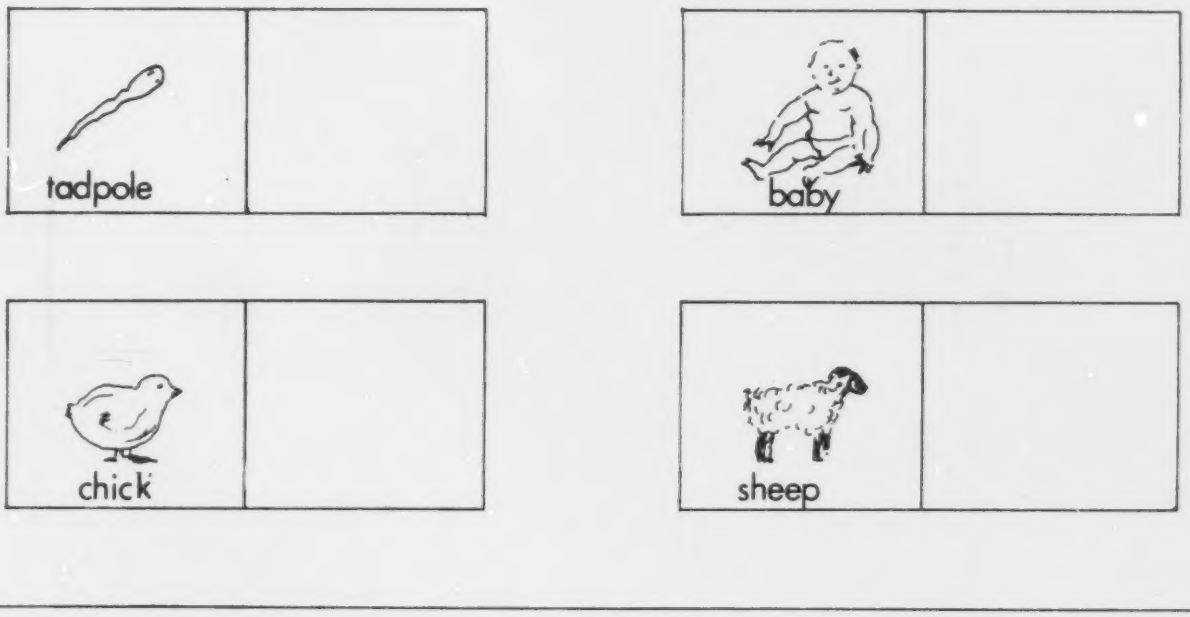
## INDIVIDUAL ANIMAL CARDS



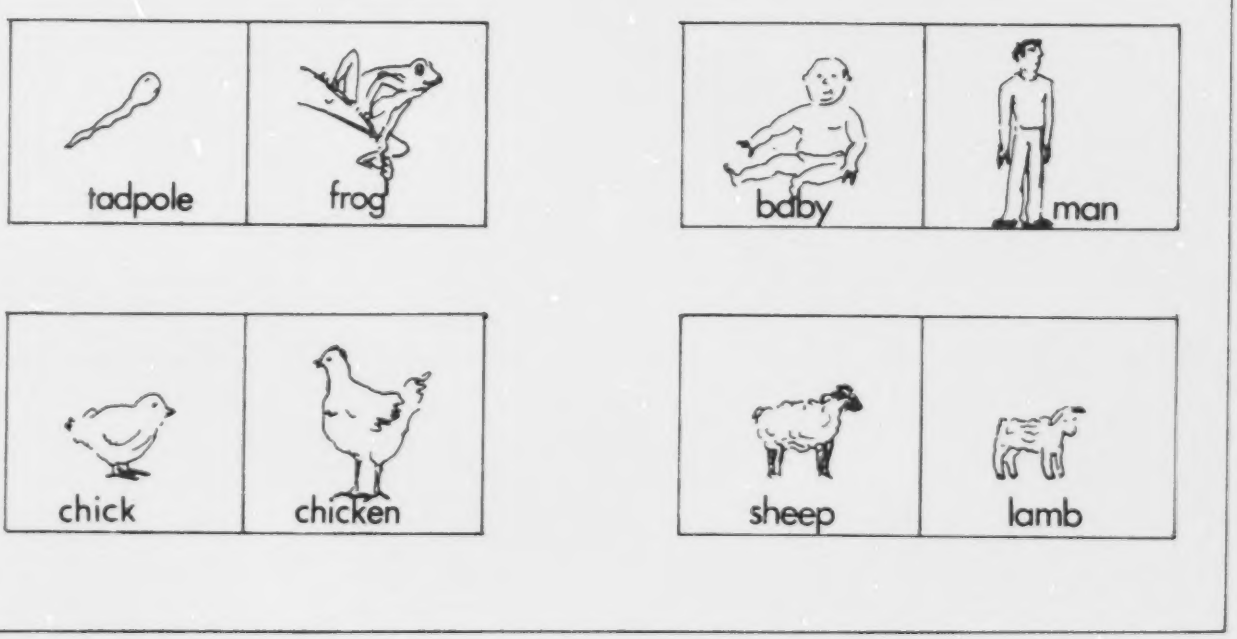



## SAMPLE ACTIVITY CARD FOR ANIMAL BABYLAND




## ANSWER CARD



# MIXED-UP ANIMALS

Objective: The student will be able to identify the names of animals.

Materials:

1. Mixed-Up Animals: Activity and Answer Cards.

Procedures:

1. The student activity card has scrambled letters of the names of the animals.
2. The student is to unscramble the letters to spell the name of an animal.
3. The student can check his or her answers on the back of the activity card.

Indication of Mastery:

This activity is self-checking; if the student gets 80% (16 out of 20) correct, he/she has mastered the activity.

Variations and Extension (List Options):

1. The student can match pictures of animals to the names they unscramble.
2. This activity can be used at a learning station.
3. Teams of students, as well as individuals, can play the game.
4. Students can make their own activity cards (with a teacher or adult helping with the spelling and handwriting if necessary).

Interest Span: 15-20 minutes

Related Subject Areas: Language Arts, Art, Spelling

Practical Hints:

Laminate the card for greater durability.

## ACTIVITY CARD (FRONT)

| | | | |
|---|---|---|---|
| 1. | GDO | 11. | NILO |
| 2. | TAC | 12. | AMN |
| 3. | BBIRTA | 13. | EBE |
| 4. | NWAS | 14. | YLF |
| 5. | NKYEOD | 15. | ZRIDLA |
| 6. | SIHF | 16. | ROSEH |
| 7. | TTLERU | 17. | IGP |
| 8. | GFOR | 18. | NKICCHE |
| 9. | PDREOAL | 19. | NEH |
| 10. | GRIET | 20. | EEHSP |

## ANSWER CARD (BACK)

| | | | |
|---|---|---|---|
| 1. | DOG | 11. | LION |
| 2. | CAT | 12. | MAN |
| 3. | RABBIT | 13. | BEE |
| 4. | SWAN | 14. | FLY |
| 5. | DONKEY | 15. | LIZARD |
| 6. | FISH | 16. | HORSE |
| 7. | TURTLE | 17. | PIG |
| 8. | FROG | 18. | CHICKEN |
| 9. | LEOPARD | 19. | HEN |
| 10. | TIGER | 20. | SHEEP |

# CAMOUFLAGED CREATURES

Objective: The student will be able to identify names of animals.

Materials:

1. "Camouflaged Creatures" Worksheet for each student.
2. Marking pen
3. Answer Card

Procedures:

1. Read the 21 sentences on the worksheet carefully with the student or student may read them alone.
2. The student is to circle the animal names hidden in these sentences.
3. The animal names are not in any single word but spelled out in the last letters of one word and the first letters of the next word or words.
4. Students can check their answers on a laminated answer card.

Indication of Mastery: Activity is self-checking.

Variations and Extensions:

1. This activity may be played in teams or it may be set up as a learning station.
2. The student can draw pictures to go with the names of the animal in the camouflaged letters.

Interest Span: 20-25 minutes

Related Subject Areas: Spelling, Fine Arts, Creativity.

Practical Hints:

1. Have a contest for the camouflaged word pictures.
2. Let the child know that there is only one word per sentence.

# "CAMOFLAGED CREATURES" ACTIVITY WORKSHEET*

| | ANSWERS FOR ANSWER CARD |
|---|---|
| 1. Most rich folks have big houses. | 1. most rich |
| 2. We, a self-confident team, won easily. | 2. We, a self |
| 3. She came, looked, and left. | 3. came, looked |
| 4. The local fire department arrived fast. | 4. local fire |
| 5. Do you know any famous Englishmen? | 5. famous Englishmen? |
| 6. This bridge will span the river. | 6. span the river. |
| 7. Some mean boys terrified Sarah. | 7. boys terrified |
| 8. The actors wangled new costumes | 8. actors wangled |
| 9. To and fro goes the sentry. | 9. fro goes |
| 10. Mr. McGoo selected a new coat. | 10. McGoo selected |
| 11. Move fast or keep still. | 11. fast or keep |
| 12. Eskimos quit only when there's a blizzard. | 12. Eskimos quit only |
| 13. The desert is a hot, terribly dry place. | 13. hot, terribly |
| 14. Brothers, hark! - the herald angels sing! | 14. Brothers, hark! |
| 15. Through the haze Brannon saw the peak. | 15. haze Brannon |
| 16. It takes luck to be a very big star. | 16. be a very |
| 17. Being shy enables one to observe others. | 17. shy enables |
| 18. The sea gleamed under the sun. | 18. sea gleamed |
| 19. We can't elope tonight. | 19. can't elope |
| 20. Is the car at the store? | 20. car at |
| 21. For Don, keys were a lot of trouble. | 21. Don, keys |

*Adapted from Ideas for Learning Centers, Elaine Moore, Jerri Greenlee Fearon Publishing, Belmont, CA. 1974.

# DOMINOED ANIMALS

Objective: The student will be able to identify and classify animals as invertebrates or vertebrates.

Materials:

1. Dominoes with animal pictures of invertebrates and vertebrates. (See sample dominoes on next page.)

Procedures:

1. The point of the game is to match vertebrates to vertebrates and invertebrates to invertebrates.
2. Two to four students may play this game.
3. Each of the students draws an equal number of dominoes, (if three are playing one domino is eliminated).
4. The first player lays one domino card down in the middle of the playing area.
5. In turn, clockwise, each student takes a turn. If he/she can match the domino on the table from the dominoes in his/her hand, he/she places the domino in the correct position, and continues until he/she cannot play any more of his/her dominoes.
6. In turn, the next person, does the same until he/she can no longer play.
7. The winner is the first one to play all of his/her dominoes.

Illustration of Mastery: Involvement in the activity as observed by the teacher.

Interest Span: 15-20 minutes

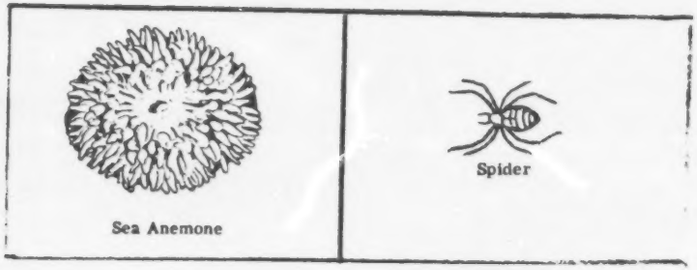
Variations and Extensions:

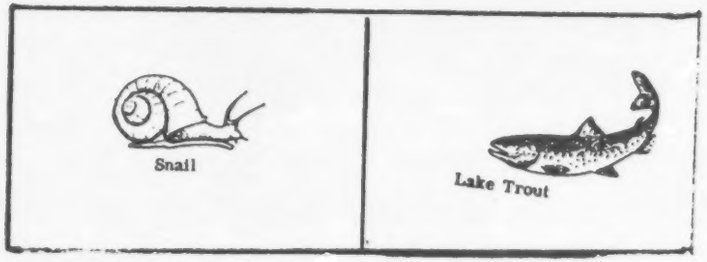
1. Dominoes may be played with other headings such as single-celled and multi-celled, mollusc and crustacean, etc.

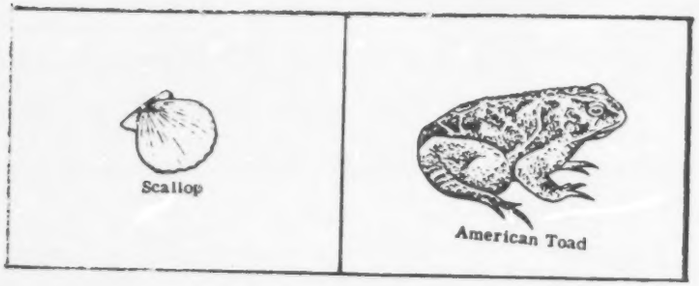
Related Subject Areas: Fine Arts, Language (configuration)

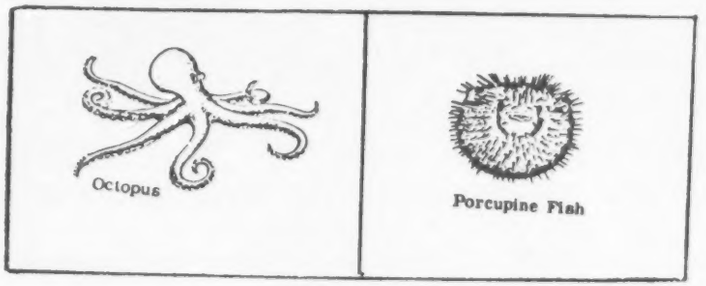
Practical Hints: The students can draw the animals that will be used for dominoes.

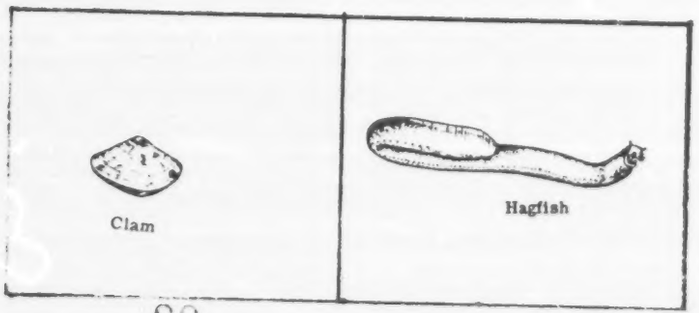
# SAMPLE DOMINOES FOR "DOMINOED ANIMALS"

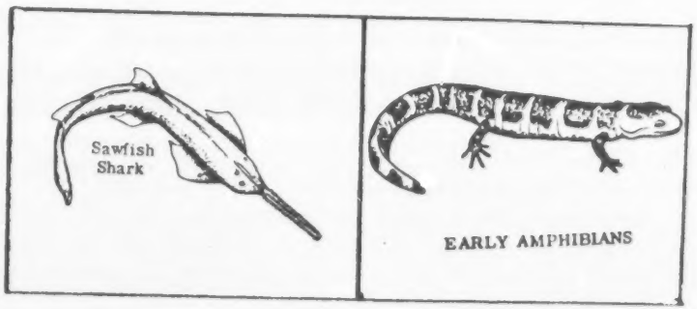


# THE ANIMAL SCHOOL

Objective: The student will be able to list the five classes of vertebrates and classify vertebrates into these classes.

Materials:

1. Copy of the poem "The Animal School."
2. The animal school booklet, which consists of five sheets each with one of the following titles:

   Mr. Fish
   Ms. Mammal
   Mr. Amphibian
   Ms. Reptile
   Mr. Bird
   (see next page for example)

3. List of 45 animals--nine from each of the five classes.
4. Construction paper and other materials to make a booklet.

Procedures:

1. Read the poem "The Animal School" to a large group of students.
2. Discuss the different classes of animals and which animals would belong in each.
3. Distribute one of each of the 5 sheets of the animal booklet to each child.
4. Have the children classify the list of 45 animals by drawing their picture or writing their names on the sheet that indicates the animals proper class.

Indication of Mastery: Classification of animals with 80% accuracy.

Variations and Extensions:

1. Use small pictures of animals for the children to place on the page that indicates the proper class.

Interest Span: 20-30 minutes

Related Subject Areas: Language Arts

Practical Hints: Make sure children understand the characteristics of the classes of vertebrates.

Did you know that animals have a school too?
Just like the ones they have for me and for you?
And each and every animal has a place to go.
So they can find out what they have to know.

Instead of having grades they have different classes.
One which has a teacher, Mr. Fish, who wears glasses
There is Ms. Mammal, Mr. Amphibian and Ms. Reptile
And if you have certain characteristics you can learn with Mr. Bird for awhile.

Let's decide which animal belongs where
Your dog, a frog, a robin, and also a bear
Place the animals in the class that's its own.
Whether the animal is little or full grown.

## SAMPLE TITLE FOR CLASSIFYING SHEET

**Mr. Fish's Class**

# HOW FIVE STAY ALIVE GAME

Objective: The student will be able to list the needs of all animals for survival (for example, food, oxygen, water, proper temperature) and will be able to identify how selected animals meet these needs.

Materials:

1. Animal cube as shown on the next page. Construct by folding on dotted lines and taping edges.
2. 25-2" x 3" cards on which one of each of the following phrases are written (number before each indicates how many of each card to make):

   1 - I eat plants and other animals
   2 - I eat other animals
   1 - I eat nectar from plants
   1 - I eat plants (nuts)
   4 - I get oxygen from the air
   1 - I get oxygen from the water through my gills
   4 - I need warmth to stay alive
   1 - I can stay alive in colder temperatures
   4 - I get water from lakes, streams and ponds
   1 - I get water from nectar of plants
   5 - Wild cards

Procedures:

1. Four or five children sit in a circle with the stack of cards face-down and the cube in center.
2. The first player throws the cube and draws the top card. If the animal matches the way the need is met, as indicated on the card, the child can keep the card. If not, the card is placed at the bottom of the pile.
3. Play continues until all the cards are gone.
4. The person with the most cards wins.

Indication of Mastery: Participation in activity

Variations and Extensions:

1. Use the activity as a station. Have the child shake the cube and write down information from card that matches the particular animal indicated on cube.
2. Make other cubes with different animal names on them.

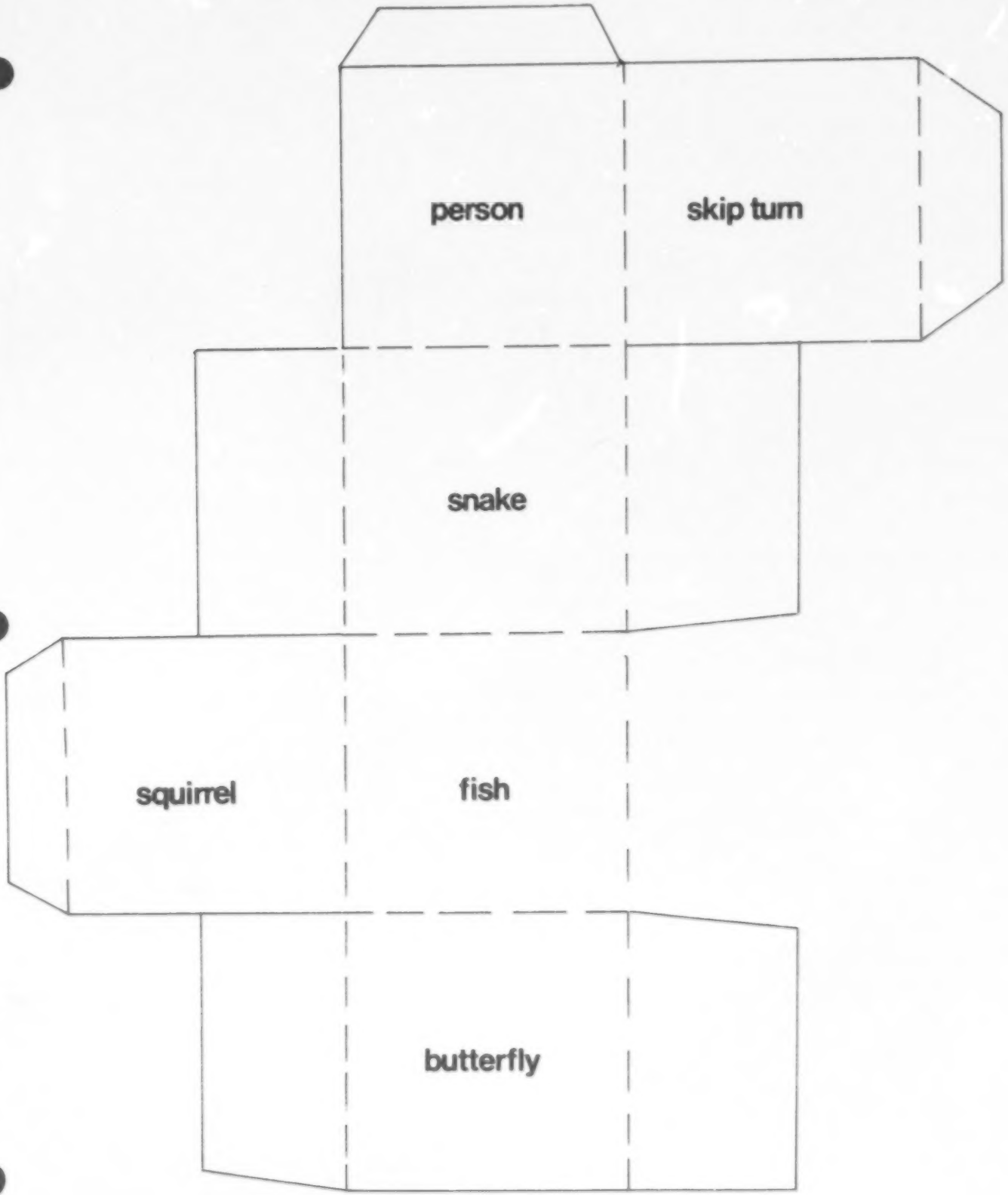
Interest Span: 15-20 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate cards for durability.

"HOW FIVE STAY ALIVE" - SAMPLE CHART



# FROM BEGINNING TO END!

Objective: The student will be able to recognize and identify life cycle stages.

Materials:

1. 2 large sheets of manila drawing paper, each folded so that there are 16 sections (4 rows, 4 columns), or a ditto marked in 16 sections.
2. Print one of the names of each of the following animals in the first section of each row:

| | |
|---|---|
| frog | chicken |
| snake | cow |
| robin | turtle |
| person | sparrow |

Procedures:

1. Give each student a copy of the two sheets of paper, pre-folded, with the animals written in.
2. Tell them that they are to draw in the three squares after each animal the following pictures:

   A. How the animal looked at birth (egg or alive)
   B. How the animal looked in mid-life (childhood)
   C. How the animal looks as an adult.

Indication of Mastery: Drawing life-cycle stages with 80% accuracy.

Variations and Extensions:

1. Use three sheets and include 4 different kinds of animals.

Interest Span: 20 to 30 minutes

Related Subject Areas: Art

Practical Hints:

1. Let children look in books for pictures to copy.

# HATCHING EGGS

Objective: The student will be able to distinguish between animals which bear their young alive and animals which lay eggs.

Materials:

1. 18 plastic Easter eggs (the kind that come apart).
2. 18 slips of paper with the following printed on them: (small pictures may be substituted)

| | |
|---|---|
| turtle | man |
| chicken | cat |
| duck | dog |
| robin | frog |
| fish | cow |
| bee | pig |
| blue-jay | kangaroo |
| woodpecker | lion |
| snake | monkey |

3. Place one slip inside each egg.
4. Record and Record Player.

Procedures:

1. Have a small group of children sit in a circle. Place the eggs in the center.
2. Have the children pass around an egg to some music. Stop it after awhile.
3. When the music stops, have the child holding the egg identify whether animal named on the slip inside could actually come out of an egg, or is born alive.
4. If the player is correct take egg out of game. If the child is incorrect place egg back in the center of circle.
5. Repeat with each egg, until there are not any eggs left.

Variations and Extensions:

1. Use as a station activity. Have children sort the eggs into two boxes, one labeled "from an egg", the other labeled "not from an egg."

Interest Span: 30-40 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Make sure the children have discussed the difference between bearing young alive and egg-laying animals.
2. Use animal songs for music, such as Old McDonald.

# ANIMAL COMMUNITIES

Objective: The student will be able to identify ways in which animals adapt to various communities.

Materials:

1. Pictures of the following animals:

| | | | |
|---|---|---|---|
| a. gerbil | d. lizard | g. goldfish | j. ant |
| b. frog | e. chameleon | h. angelfish | |
| c. hamster | f. guppy | i. worm | |

2. Resource books about animals.

Procedures:

1. The students in the group pick one of the animal pictures listed above.
2. They read a book to find out what other animals their animal lives with.
3. They write up a report on the animal community their animal lives with.
4. The students read their reports to the class and the class discusses what enables these animals to live in the same community.

Illustration of Mastery: Teacher observation.

Variations and Extensions:

1. Use different animal pictures and have students repeat project.

Interest Span: 2 science periods

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate pictures for durability.

# GO TO THE ZOO!

Objective: The student will be able to classify animals into general categories--vertebrates and invertebrates.

Materials:

1. Go to the Zoo card deck which consists of 60, 3x5 inch cards. On 15 of the cards print the word "vertebrate." On 15 other cards, print the word "invertebrate." On the other 30 cards, one of each of the following animals is drawn on (picture) or the name is printed on:

| | | | |
|---|---|---|---|
| dog | lizard | kangaroo | hydra |
| cat | carp | oyster | butterfly |
| lion | whale | lobster | ladybug |
| robin | gorilla | crab | bee |
| bluejay | salamander | seahorse | beetle |
| toad | woodpecker | starfish | box elder bug |
| snake | toad | grasshopper | moth |
| | | ant | spider |

Procedures:

1. A group of four students sit in a circle. One person chosen as the dealer deals seven cards to each player and then places the deck in the center of the circle. The deck is then referred to as the "zoo."

2. The students look at their cards and take out any pairs. A pair consists of an animal matched with the name of its proper class "vertebrate" or "invertebrate". For instance, the "crab" card would match an "invertebrate" card. Two animal cards on two "like" word cards would not be a match.

3. The player on the right can then ask any player in the group for a card that would match any of the cards left in his/her hand. For instance, if they had a "dog" card they would ask for a card that said "vertebrate." Or, if they had a card that said "invertebrate" they would ask for any animal that is an invertebrate.

4. If the player has a card that matches what another player asks for, he/she gives it to him/her. If not, he/she says "Go to the Zoo." The player asking then draws a card from the "Zoo" card deck.

5. A player can keep asking other players if he/she gets a match the first try and other successive trys. The turn goes to the next player on the right when the first player does not succeed in getting a match.

6. When a player is out of cards, he/she is the winner. The other players keep playing until there is only one player left or there are no other animals in the zoo.

Indication of Mastery: Participation in Activity

Variations and Extensions:

1. Use the deck for a concentration game.

Interest Span: 20-30 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate the cards for durability.
2. Decorate back side of cards with a zoo picture.

# ANIMAL GRAPH

Animals/Interpreting Data
Formulating Hypotheses
10-12/Independent

Objective: The student will be able to classify vertebrates into classes: amphibians, birds, fish, mammals, reptiles.

Materials:

1. Animal Graph Worksheet (see next page).
2. Various resource books on animals.

Procedures:

1. Students complete the worksheet using their knowledge of animals or resource books.

Variations and Extensions:

1. Use as a small group activity, allowing the children to practice the process of communicating by sharing information.
2. Reverse the activity. Give the students a list of animals, the class of each, and have them develop a graph summarizing the characteristics of each class.

Interest Span: 30-40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Make sure children are familiar with the classes. Use as a review activity.

## ANIMAL GRAPH WORKSHEET

Using the graph below try to determine which class each animal in the list below belongs in. Write in what you think is the answer. You may look for information in books for the characteristics of the animals you are not familiar with.

CHARACTERISTIC

| CLASSES OF VERTEBRATES | HAIR | FEATHERS | SCALES | TWO WINGS | TWO LEGS | FOUR LEGS | FINS | CLAWS | PRODUCE MILK | LUNGS | GILLS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MAMMALS | All | | | Few | Some | Most | | Some | All | All | |
| BIRDS | | All | All | All | All | | | Some | | All | |
| REPTILES | | | All | | | Most | | Most | | All | |
| AMPHIBIANS | | | | | Few | Most | | | | Most (part of life) | All (part of life) |
| FISH | | | All | | | | All | | | | All |

| Animal | Class | Animal | Class |
|---|---|---|---|
| hyena | _____ | porcupine | _____ |
| tree toad | _____ | tapir | _____ |
| salamander | _____ | coatimundi | _____ |
| leopard | _____ | gibbon | _____ |
| pelican | _____ | flamingo | _____ |
| platypus | _____ | bald eagle | _____ |
| scarlet macaw | _____ | | |
| fennec | _____ | | |

Adapted from Modern Science, Level 4. Laidlaw Brothers, 1970.

# I DON'T BELONG HERE #1

Objective: The student will be able to identify six major categories of vertebrates.

Materials:

1. "I Don't Belong Here -- #1" Activity Sheet
2. "I Don't Belong Here -- #1" Answer Sheet
3. Zoology reference book

Procedures:

1. The student will read through each of the six sets of vertebrates on worksheet.
2. The student's task is to circle the animal that does not belong in that particular class or order.
3. There is only one animal that does not belong in each group.
4. The student may refer to a zoology book if needed.

Illustration of Mastery: This activity is self-checking; 5 out of 6 correct is mastery.

Interest Span: 30-35 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. This activity may be made into a permanent activity board.
2. This activity should not be rushed. Let the student take his/her time, it's rather hard!
3. The word in parentheses following the numbers 1 through 5, tell the student that the group of animals is either class or order, and that the one that doesn't fit isn't in that class or order.

## SAMPLE WORKSHEET

| 1* (Class) | 2* (Order) | 3* (Order) |
|---|---|---|
| Raja | Newt | Gila monster |
| Sea horse | Salamander | Iguana iguana |
| Long-nosed gar | Mud puppy | Rattlesnake |
| Lungfish | Leopard frog | California boa |
| | | Hawksbill |

| 4* (Class) | 5* (Order) | 6* (Order) |
|---|---|---|
| Kookaburra | Dog | Man |
| Pelican | Cat | Monkey |
| Praying Mantis | Mink | Elephant |
| Tropical Toucan | Horse | Gibbons |
| Spoonbill | Seal | Tarsier |

## SAMPLE ANSWER SHEET

| 1* (Class) | 2* (Order) | 3* (Order) |
|---|---|---|
| Raja | Newt | Gila monster |
| Sea horse | Salamander | Iguana iguana |
| Long-nosed gar | Mud puppy | Rattlesnake |
| Lungfish | Leopard frog | California boa |
| | | Hawksbill |

| 4* (Class) | 5* (Order) | 6* (Order) |
|---|---|---|
| Kookaburra | Dog | Man |
| Pelican | Cat | Monkey |
| Praying Mantis | Mink | Elephant |
| Tropical Toucan | Horse | Gibbons |
| Spoonbill | Seal | Tarsier |

* The numbers do not refer to any particular sequence.

# PICK-A-PART

Animals/Formulating Questions
10-12/Small group

Objectives: The student will be able to identify the main parts of animals (especially those that determine class.)

Materials:

1. One Pick-A-Part Game Board constructed as follows:

   a. Cut 14-3" x 5" pieces of tagboard or use index cards.

   b. Tape the cards in four rows (3 rows would have 4 cards, the last row would have 2 cards) on a 25" x 15" piece of tagboard. Place the cards so that the 5-inch edge is parallel with the 25" edge of the large sheet of tag. Also, place tape on the top 5-inch edge only so that the card makes a flap.

   c. Print one of the following body parts on each of the 14 cards: hair, feathers, wings, scales, gills, bony skeleton, fins, lungs, mammary glands, ligaments, vertebrae, spinal cord, limb, trunk and head (considered one part), legs

   d. Write the corresponding question under the flap on the big piece of tagboard. Use the Pick-A-Part Question List on the next page for this information.

2. Pencil and paper for scoring.

Procedures:

1. Three children play this game. One child is the leader and holds the board.

2. The first player selects a body part and formulates a question that defines that part. The question should include what class or classes of animal characteristically have this part and what purpose this part has.

3. The leader then lifts the flap that indicates that part and reads the question written under the flap. If it matches the question given by the player, the player receives a point and that part can no longer be used in the game. If it does not match, no point is given and it can again be picked in the game.

4. Play continues until all parts have been used.

5. The person with the most points wins.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Reverse the activity. Use the part definitions as answers on top of flap and the names of the parts as questions under the flap.

Interest Span: 10-15 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate large board and flaps before taping them together.

## PICK-A-PART QUESTION - ANSWER LIST

| Answer | Question |
|---|---|
| hair | What makes up the body covering of most mammals? |
| feathers | What makes up the body covering of birds? |
| wings | What are the limbs that birds use for flying? |
| scales | What is the body covering for reptiles and fish called? |
| gills | What organs allow young amphibians and all fish to take in oxygen? |
| bony skeleton | What part of fish has no cartilage? |
| fins | What are "limbs" on fish called? |
| lungs | What part of mammals, birds, reptiles and adult amphibians take in oxygen? |
| mammary glands | What organs produce milk in mammals? |
| ligaments | What are the cord-like fibers that connect the vertebrae called? |
| vertebrae | What are the separate bones that make up the backbone called? |
| spinal cord | What is the name of the large nerve that is surrounded by the backbone? |
| limb, trunk and head | What are the three main body parts of all vertebrates? |
| legs | What are the limbs of mammals and reptiles called? |

# REPRODUCTION RIDDLES

Objective: The student will be able to describe ways in which animals reproduce.

Materials:

1. Reproduction Riddle Sheet (see next page)
2. Various reference and science books.

Procedures:

1. The student reads each riddle and identifies as many animals as possible that reproduce in that manner.

Indication of Mastery: Identification of animals with 80% accuracy.

Variations and Extensions:

1. Give students names of animals and have them write a riddle.

Interest Span: 20-30 minutes

Related Subject Areas: Reading and Language Arts

Practical Hints:

1. Use as a review activity after students have studied reproduction. Make sure students have studied animals used for riddles.

REPRODUCTION RIDDLES - cont.

1. I am only made of one cell
   And I reproduce well
   Please do not laugh
   I just divide in half.
   I am an (amoeba)

2. I start out as an embryo
   But I still have a long way to go
   I grow inside an egg, but not very quick
   You guessed it, I am a (chick)

3. I can reproduce in one of three ways
   One is by sperm and eggs which takes 10 to 70 days
   Sometimes I split crosswise or up and down
   But budding is my most common way of reproduction to be found.
   I am a (hydra)

4. We are a group of animals with many different kinds
   We reproduce in one of two ways, you will find
   We either lay eggs or bear our young alive
   We live in water and with our gills we survive.
   You guessed, we are a group of animals called (fish).

5. I am a fish that is born alive
   You can buy me at most pet stores
   Soon as I am born I swim and take care of myself
   I don't need my parents any more
   I am a (guppy).

6. Most of us are born alive
   We develop inside our mothers
   A placenta feeds us as embryos
   Just like it will for any of our brothers
   We are a group of animals called (mammals).

7. We make homes that are called nests
   Laying eggs is what we do best
   Our young do not develop fully before they hatch into sight
   Although there are some exceptions which are chickens and a bobwhite
   We are a group of animals called (birds).

8. As a baby I look nothing like the parent who made me
   I have no lungs or legs that you can see
   But I change into a frog as I grow
   Yes you guessed it, I am a (tadpole).

# WHAT DO I NEED GAME

Objective: The student will be able to identify the life supporting needs of specified animals.

Materials:

1. The names of each of the following animals printed on a 2"x3" strip of tagboard:

   a. frog
   b. snake
   c. man
   d. fish
   e. robin

2. An egg timer or stop-watch.

3. Paper and pencil.

4. "What Do I Need" Score Card (see next page).

5. "What Do I Need" Answer Key (see next page).

Procedures:

1. An individual student sets the timer for 30 seconds. He/she then selects a tagboard strip and silently reads the name of the animal written on it.

2. Next, using the paper and pencil, he/she writes down as many life-supporting needs of that animal as possible. He/she continues writing these needs until the timer goes off or he/she can't think of any more needs.

3. The person then checks his/her answers with the answer key and records the number of correct responses and time on the score card.

4. He/she repeats the procedure with each separate animal.

5. The score sheet is saved and individuals repeat the activity trying to improve their time and number of correct responses.

Indication of Mastery: 80% correct responses in 30 seconds time.

Variations and Extensions:

1. Decrease or increase time to make activity more appropriate and/or challenging to the needs of the individual student.

Interest Span: 10-15 minutes

Related Subject Areas: Math

WHAT DO I NEED GAME - cont.

Practical Hints:

1. Laminate tagboard strips for durability.
2. Make sure the life-supporting needs of each animal have previously been discussed before a child does activity.

"WHAT DO I NEED" SCORE CARD

| | | |
|---|---|---|
| Name of Animal:<br>Time:<br>Number of Correct Responses: | Name of Animal:<br>Time:<br>Number of Correct Responses: | Name of Animal:<br>Time:<br>Number of Correct Responses: |
| Name of Animal:<br>Time:<br>Number of Correct Responses: | Name of Animal:<br>Time:<br>Number of Correct Responses: | Name of Animal:<br>Time:<br>Number of Correct Responses: |

"WHAT DO I NEED" ANSWER KEY

| Name of Animal | Life Supporting Needs |
|---|---|
| man | food (plant and animals)<br>oxygen<br>water<br>temperature<br>shelter<br>clothing<br>love |
| fish | water to live in<br>oxygen<br>food<br>cold temperature |
| frog | water environment during child stage<br>land environment during adult stage<br>mud for hibernation<br>food<br>oxygen |
| robin | feathers for insulation<br>warm temperature<br>food (large amounts)<br>oxygen |
| snake | other animals for food<br>oxygen<br>warm temperature |

# EXTINCTION CONCENTRATION

Objective: The student will be able to identify human actions that cause animals to become extinct and identify animals that are extinct or species that are in danger of becoming extinct.

Materials:

1. 10-3" x 3" Extinction Concentration Cards. The 16 items from the Extinction Concentration Answer Key should be printed on one of each of the cards (see next page).
2. Extinction Concentration Answer Key (see next page).

Procedures:

1. Four or five children sit in a circle. They lay the concentration cards face-down in 4 rows with four cards in each row.
2. The first player turns over two cards. If the two cards indicate an animal and its reason for extinction, it is a match and the player keeps the two cards. He or she can then keep taking turns until he/she no longer makes a match. If he/she does not make a match, the cards are turned back over.
3. The play continues counter-clockwise until all cards are used up.
4. The player with the most cards wins.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use as an individual station activity allowing a student to practice making matches.

Interest Span: 15-20 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate cards for durability.

## ITEMS FOR EXTINCTION CONCENTRATION CARDS AND EXTINCTION CONCENTRATION ANSWER KEY

| Animal | Reason for Extinction or Becoming Endangered Species |
|---|---|
| alligator | overhunted by men who wanted skin for shoes, belts and purses |
| white heron | killed by hunters for feathers and eggs, taken by men who wanted to eat them |
| wood duck | overhunted, couldn't find water because it was being used for irrigation |
| ivory-billed woodpecker | disappeared as their food supply, trees, were logged off |
| walrus | overhunted for meat, blubber, oil and hides |
| buffalo | overhunted for hides and for sport |
| grizzly bear | overhunted by gamehunters and persons who considered them a menace |
| bald eagle | overhunted by people who killed them for a sport, killed by chemical DDT that men used for killing insects |

Animals/Observing
Communicating
Small group/10-12

# THE MINI ZOO

Objective: The student will be able to describe simple animals, tell how they benefit and hinder man.

Materials:

1. Reference books on simple animals.
2. 5- Mini-Zoo Task Cards

Procedures:

1. Each of a small group of five children reads the one task card. They decide who gets what job in the zoo.
2. Each child uses a reference book to find out the information needed to carry out the task he/she was assigned on the card.
3. Each student writes a report or makes another project, such as drawings to tell what they found.
4. Children share their report or project with the rest of the group and adult leader who is responsible for evaluating each child's project.

Indication of Mastery: Evaluation of project by teacher or other responsible adult.

Variations and Extensions:

1. Include other small animals in the zoo.
2. Have each small group share what they have found with the large group.

Interest Span: one science class period each day for two weeks.

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate task cards.
2. Make sure reference materials give information needed.

## A MINI ZOO - GETTING STARTED

You and your friends are going to create a mini-zoo. It will be just like any other zoo, except that it will have smaller animals. These animals are as follows:

| | |
|---|---|
| Paramecium | Fly |
| Amoeba | Mosquitoe |
| Euglena | Bee |
| Planarian | Flea |
| Flatworm | |

Each of you will have a job in the zoo. The jobs are listed below. After each job is a description of what the job involves. When you and your group mates have decided who gets what job, you use a reference book to find what your job is like for every animal in the zoo. Then you write a report to be read by each member in your group. Happy zoo-creating.

### MINI-ZOO TASK CARDS

Cage builder - This person designs a cage or home for each animal. Make sure the cage or home is as close to each animal's real environment as possible

Zoo advertiser - This person advertises the animals in the zoo so there are lots of visitors. Find out what each animal looks like and how you can communicate this to other children so they will want to come visit the zoo.

Zoo dietician - This person decides what and how much each animal eats every day.

Zoo policeperson - This person finds out if or how each animal can do harm to any animal in the zoo or to any visitor.

Zoo sign-maker - This person finds out the correct name of each animal, how each animal benefits the total environment.

# LET'S MAKE AN AQUARIUM

Objective: The student will be able to construct an aquarium.

Materials:

1. Aquarium tank (10 gallon)
2. Water for tank
3. Fish (three or four different kinds)
4. Fish food
5. Rocks for the aquarium
6. Filter
7. Light
8. Net

Procedures:

1. The above materials are to be accessible to the student.
2. The student is to plan an aquarium, by deciding the materials that are needed and the number of fish to be included in the tank.
3. The student will care for the aquarium for two weeks, feeding the fish and cleaning the aquarium.
4. The student will observe and record any changes during the two weeks.
5. At the end of the two weeks, the student will write a report of his/her two week observation and work done involving the aquarium.

Variations and Extensions (List Options):

1. Have students work in small groups.
2. Keep a daily log of events.
3. Create a fish booklet on a specific type of fish.

Interest Span: Intermittently for two weeks.

Related Subject Areas: Language Arts

Practical Hints:

1. Keep the aquarium in a wet area.
2. Don't worry if there's a mess.

# I DON'T BELONG HERE #2

Objective: The student will be able to identify five major categories of invertebrates.

Materials:

1. "I Don't Belong Here --#2" Activity Sheet
2. "I Don't Belong Here --#2" Answer Sheet
3. Pencil
4. Zoology reference book

Procedures:

1. The student will read through each of the five sets of invertebrates.
2. The student's task is to circle the animal that does not belong in that particular class or order.
3. There is only one animal that does not belong in each group.
4. The student may refer to a zoology book as needed.

Illustration of Mastery: This activity is self-checking; 4 out of 5 correct will illustrate mastery.

Variations and Extensions:

1. The list may be shortened by having only three words to pick from in each group.
2. A chart of all the subphylums, classes, orders, etc. will be very helpful.

Interest Span: 30-35 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. This activity may be made into a permanent activity board.
2. This activity should not be rushed. Let the student take his/her time, it's rather hard!

"I DON'T BELONG HERE -- #2" - cont.

## SAMPLE WORKSHEET

| 1* (Order) | 2* (Class) | 3* (Class) |
|---|---|---|
| Chlamydomonas | Hydra | Planaria |
| Haematococcus | Obelia | Taenia |
| Gonium | Astrangia | Phagocata |
| Volvox | Gonionemus | Dugesia |
| Euglena | Physalia | |

| 4* (Class) | 5* (Class) |
|---|---|
| Mopalia | Lumbricus |
| Haliotis | Tubifex |
| Littorina | Enchytraeus |
| Helix | Hirudo |

## SAMPLE ANSWER SHEET

| 1* (Order) | 2* (Class) | 3* (Class) |
|---|---|---|
| Chlamydomonas | Hydra | Planaria |
| Haematococcus | (Obelia) | (Taenia) |
| Gonium | Astrangia | Phagocata |
| Volvox | Gonionemus | Dugesia |
| (Euglena) | Physalia | |

| 4* (Class) | 5* (Class) |
|---|---|
| (Mopalia) | Lumbricus |
| Haliotis | Tubifex |
| Littorina | Enchytraeus |
| Helix | (Hirudo) |



* The numbers do not refer to any particular sequence

# WATERY CREATURES

Objective: The student will be able to use classification as a tool for studying animals.

Materials:

1. "Watery Creatures" Activity Cards
2. "Watery Creatures" Chart
3. Reference zoology book or science textbook with the needed material available.

Procedures:

1. The student will place the Watery Creature Card under the correctly labeled column.
2. The student may refer to the zoology book if she/he needs assistance.
3. See "Basic Starter List" for suggested animals.

Illustration of Mastery: Activity is self-checking; mastery is 100 percent.

Variations and Extensions (List Options):

1. Slides may be used instead of cards. Students can draw each of the animals on the prepared slides and then place the drawing under the correctly labeled column.

Interest Span: 25-30 minutes

Related Subject Areas: Language Arts, Reading, Fine Arts

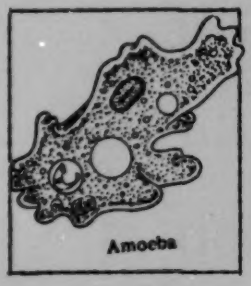
Practical Hints:

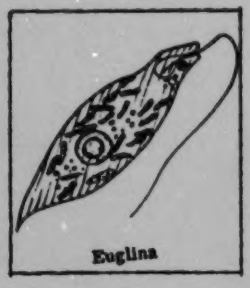
1. The activity chart for "Watery Creatures" should be made at least two or three times the size of the example of the game board.

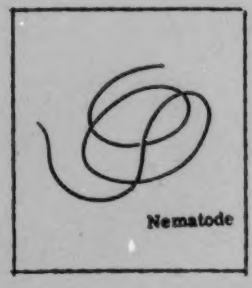
Basic Starter List:

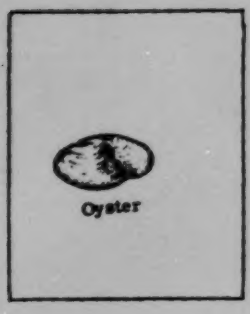
| | | | | |
|---|---|---|---|---|
| amoeba | euglena | venus flower basket | finger sponge | tape worm |
| oyster | mussel | sea anemone | hydroid | coral |
| nematode | squid | jellyfish | earthworm | octopus |
| paramecium | | | | |

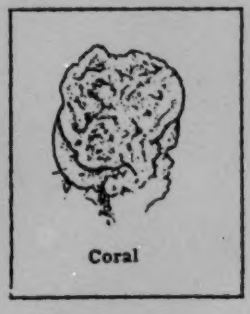
## SAMPLE ACTIVITY CARDS

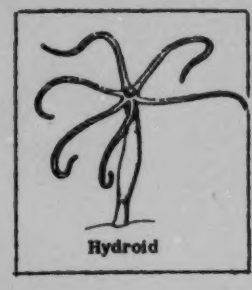


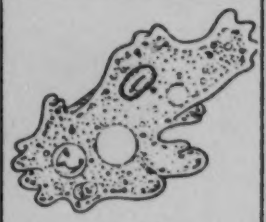
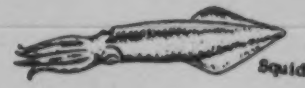







# "WATERY CREATURES" SAMPLE ACTIVITY CHART - ANSWER CARD*

| ONE-CELLED | MULTI-CELLED | FIXED SHAPE | HAS FLAGELLA | HAS CILLA | HAS A PEN AND INK |
|---|---|---|---|---|---|
|  Amoeba<br> Euglina<br> Paramecium | Venus Flower Basket (Glass Sponge)<br> Finger Sponge (Horny Sponge)<br>Oyster<br>Nematode<br>Mussel<br>Squid<br>Tapeworm<br>Jellyfish<br>Sea Anemone<br>Earthworm<br>Hydroid<br>Coral<br>Octopus<br>Planeria | Octopus<br> Mussel<br> Oyster<br> Coral<br> Jellyfish<br>Planeria<br>Sea Anemone<br>Finger Sponge<br>Venus Flower Basket<br>Nematode<br>Squid<br>Earthworm<br>Hydroid<br>Paramecium<br>Euglena | Euglina | Paramecium |  Squid |

110 119

120

*Due to limited space, the names have been written in place of the pictures.

# EXCITING ECOLOGY

# ECOLOGY

| Age Level | Objectives | Activity Title | Page |
|---|---|---|---|
| 5-8 | The student will be able to: | | |
| | 1. describe how living things are affected by their environment. | THERE IS NO PLACE LIKE HOME | 114 |
| | 2. demonstrate his or her dependence on animals. | MYSTERY MEAT | 116 |
| | 3. describe how every food can be traced to a plant. | CRAZY MEALS | 118 |
| | 4. describe obvious ways in which we misuse our environment: e.g., litter, dirty water, and dirty air. | DEVIOUS DETECTIVES | 120 |
| | 5. reuse objects from the environment. | LITTLE CRITTERS AND EGG CARTON CREATURES | 122 |
| | 6. identify ways in which he/she can individually protect the environment. | LITTLE AMERICAS | 124 |
| | | DON"T THROW IT! RECYCLE IT! | 125 |
| 8-10 | 7. understand the interdependence of all living things. | FOOD CHAINS | 127 |
| | 8. define ecology and list examples of what needs to be done for effective ecology: e.g., stopping littering, energy waste, water and air pollution. | STUMP THE DELIGHTFUL DICTIONARY | 128 |
| | 9. describe and explain the importance of individual effort in effective conservation. | SLASH THAT TRASH | 130 |
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| | 11. identify three types of pollution in his/her personal environment. | SNOW SHOW | 133 |
| | | SIGNS OF POLLUTION | 134 |
| | 12. state what he/she is doing at home or at school to save the environment in his/her own community. | I SAVE BY . . . | 136 |
| 10-12 | 13. describe the food chain and the consequences when it is broken. | THE MISSING LINK | 137 |
| | 14. describe the food chain and construct a model of a food chain by selecting an animal and tracing its food source. | ANIMAL EDIBLES | 139 |

| Age Level | | Objectives | Activity Title | Page |
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| 10-12 cont. | 15. | list the different sources of energy and indicate which are most available, usable and non-polluting. | ENERGY WIZARDS | 140 |
| | 16. | list and explain ways in which an individual can conserve energy. | A DAY IN THE LIFE OF AN ENERGY CONSERVER | 141 |
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| | 20. | classify items as to whether they conserve or use energy. | ENERGY TARGETS | 148 |
| | 21. | classify items as to whether they conserve or pollute the air. | POLLUTE CHUTES AND LADDERS | 150 |
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| | 25. | plan and execute an ecology program in his/her community and collect and graph the items collected. | RUBBISH RACE | 158 |
| | 26. | list causes of air pollution and its effects on the environment. | AIR POLLUTION CONCENTRATION | 159 |
| | 27. | infer what the environment was like before pollution existed. | THE GOOD OLD DAYS | 160 |

# THERE IS NO PLACE LIKE HOME

Objective: The student will be able to describe how living things are affected by their environment.

Materials:

1. Stick puppets of the following living things:

| | | |
|---|---|---|
| fish | cow | tree |
| human | bear | strawberry |
| bird | rabbit | bee |
| snake | flower | |

The puppets can be made by drawing the picture of the living objects on tagboard, cutting them out, laminating them, and gluing them to tongue depressors (obtained from your local doctor), or popsicle sticks.

2. Transparency with the following incompleted poem:

I am a _____ and I am alive
And my home is made to help me survive
_____, _____, _____ nature gives to me
Because even though I may sometimes roam
I know that there is no place like home.

3. Overhead projector and a portable screen.

Procedures:

1. Give each student in a small group one of the stick puppets. Project the transparency so that one child who will be facing the rest of the group can easily read it. A portable screen will be behind or to the back of the group of students.

2. Each child, using the puppet he was handed, will stand in front of the group and read the poem and complete it using the environmental features of the living object in his or her hand.

3. After the students have all had a turn, read and discuss the following poem:

THE CRY OF THE TURTLE by Pauline C. Peck

My parlor's polluted
My bedroom's a fright
My backyard is littered
My sky isn't bright
For the sun is hiding
With smog on its face
And who is to blame
For destroying my place?

Some humans are guilty
Of spoiling this sight
They used up the beauty
Then fled in the night
And only the humans
Can find a solution
To bring back the beauty
And stop the pollution

Ask questions such as, "What would happen to the home of the living object in your hand if these things were to happen?" Lead into the idea that the homes of living objects are meant for that particular living object and that we have to make sure their homes stay safe.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Make copies of the poem and have the children write in the words for their living object.
2. Have the children draw a picture illustrating the poem when they have completed it.
3. Make "peek boxes" out of shoe boxes illustrating the homes of the animals.

Interest Span: 30-40 minutes

Related Subject Areas: Language Arts, Reading

Practical Hints:

1. Read through the poem aloud as a group so children become familiar with it. It is a good idea for the teacher to give one example before the children try.
2. Stress the idea that environments and homes are ideal to particular living things and that if they are destroyed the living things may be destroyed also.

# MYSTERY MEAT

Objective: The student will be able to demonstrate his or her dependence on animals.

Materials:

1. Pictures of the following animals on 3" x 5" cards:

   cow
   chicken
   pig
   sheep
   turkey

2. Mystery Meat Board made out of a large sheet of tagboard. On various places on the board place pictures of pigs (3), sheep (1), turkey (1), chicken (1), cow (4). Tape over each picture (tape the top edge only) a picture of a meat that comes from that animal. Include the following meats:

   Pig: bacon, ham, and pork chop
   Cow: hamburger, liver, steak, beef roast
   Turkey: a large turkey
   Chicken: chicken leg

See illustration on the next page.

Procedures:

1. The student should pick one card out of the 3" x 5" stack of pictures.
2. Using the picture, the student looks on the board to find all the meats that come from that animal.
3. When the students chooses a meat he or she then can lift up the flap and if the pictures match his or her choice, it is correct.
4. Repeat the procedure with each picture in the set.

Indication of Mastery: Completion of the "Mystery Meat" board with 80% accuracy while being observed by the teacher.

Variations and Extensions:

1. Allow the children to work in pairs.

Interest span: 15-20 minutes.

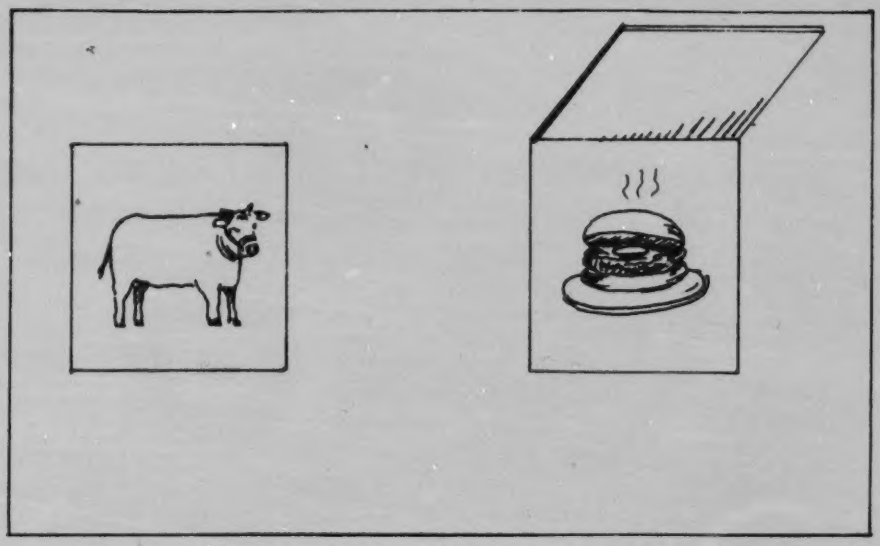
Related Subject Areas: Language Arts

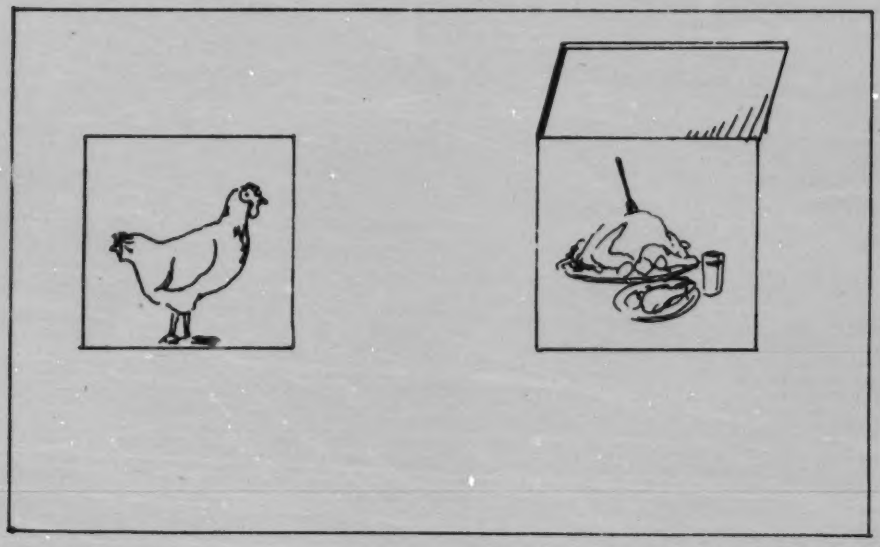
Practical Hints:

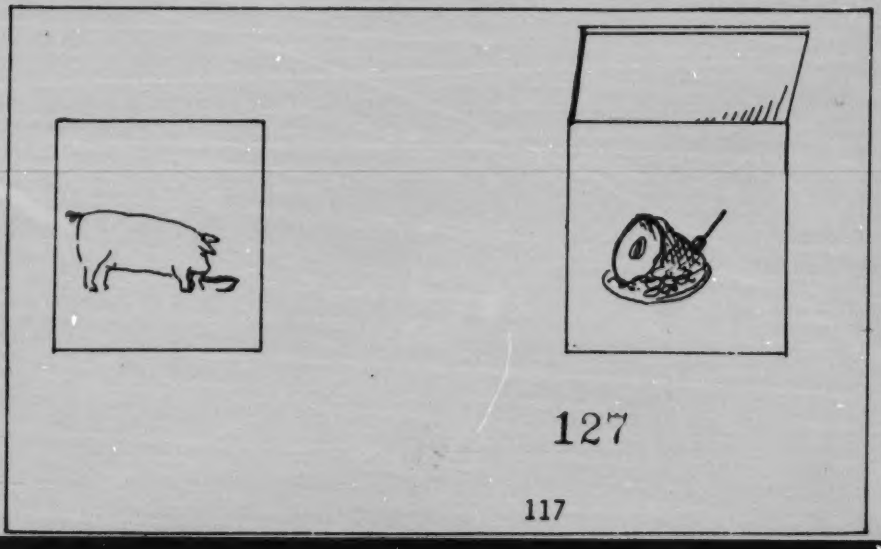
1. Laminate the Mystery Meat board and the picture cards for durability.
2. Make sure the children are familiar with the meats and animals before participating in this activity.

# SAMPLE MYSTERY MEAT PICTURES

## SAMPLE MYSTERY MEAT BOARD







# CRAZY MEALS

Objective: The student will be able to describe how every food can be traced to a plant.

Materials:

1. A meal card for each student in a group of four.
2. Meal cards which can be made from a piece of cardboard divided into 9 equal sections. A picture of food is placed in each section. These pictures can be cut out of magazines or drawn.
3. Key cards with a plant name written on it, corresponding to each type of food on the meal cards.

Examples: Key card: tomato
Corresponding foods: tomato soup
pizza
spaghetti

Procedures:

1. Pass out nine markers and one meal card to each student in the group.
2. Explain to the students that the meal card is all the food they ate that day.
3. Put the key cards in a container to be drawn by the leader at random.
4. Have the leader draw a key card and say, "Did you eat anything today from a (name on key card)?"
5. Have the students try to find a food on their card which can be traced to that plant. If they do have one, they cover it with a marker.
6. When a student completes a card, have him/her "read back" the foods to the leader and indicate what plant it can be traced to.

Example: Spaghetti sauce comes from tomato plants.

Indication of Mastery: Participation in game

Variations and Extensions: Substitute words for pictures

Interest Span: 20 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Use foods on the meal cards which are familiar to children.
2. Don't use more than one food from a particular plant on each meal card. Try not to repeat foods from one plant more than twice in each set of 4 cards.

## SAMPLE SET OF MEAL CARDS

| | | |
|---|---|---|
| Spaghetti Sauce | Pickles | Can of corn |
| Loaf of bread | Pork n' beans | Rice Krispies |
| M'M's | Potato chips | Peanut butter |

| | | |
|---|---|---|
| Grape jelly | French fries | Applesauce |
| Can of beans | Pizza | Candy bar |
| Oatmeal cookies | Rice-A-Roni | Strawberry poptarts |

| | | |
|---|---|---|
| Corn flakes | Onion soup | Pancakes |
| Grape jelly | Pickles | Oatmeal |
| Vegetable Soup | Blueberry Pie | Peanuts |

| | | |
|---|---|---|
| Biscuits | Mixed vegetable | Mashed potatos |
| Corn Chex | Onion rings | Tomato |
| Apple Pie | Blueberry Muffins | Strawberry Poptarts |

Key Cards: 1 card for each (3 x 5 inches or smaller)

tomato plant
corn stalk
oats
onion plant
strawberry plants
peas
carrots
wheat
apple tree
sugar cane
peanut plant
lima beans
rice
grape vine
potato plant
cucumber vine
beans

*Substitute pictures for words on the meal cards.

# DEVIOUS DETECTIVES

Objective: The student will describe obvious ways in which we misuse our environment: litter, dirty air, and dirty water.

Materials:

1. Laminated Devious Detective Cards (see next page)
2. Laminated Devious Detective Badges (see next page)

Procedures:

1. Hand out the Devious Detective Cards and Badges to the students just before going home for a weekend.
2. Discuss what a detective is and what he does (looks for clues). Tell the children that we are all going to be detectives for a weekend. Have the children pin on the badges. Next, explain that the clues we are trying to detect are ways in which the environment has been misused and that these clues are listed on the card. Tell the children to take the cards home for the weekend, look for the clues, write down where they saw them, and to bring the cards back when they are finished.
3. As the cards are brought back to school have each child describe what they saw and where they saw it. Call this "The Detectives' Discussion".

Indication of Mastery: Completion and explanation of Detective Card.

Variations and Extensions:

1. Continue the process of looking for clues for a week or longer.

Interest Span: one week

Related Subject Areas: Reading, Language Arts

Practical Hints:

1. Stress the fact that the cards are to be returned. Good detectives show what they have found to others.

# DEVIOUS DETECTIVES

Be a Devious Detective-Find a clue

Sample Card

I'm
a
Devious
Detective

Sample Badge

# LITTER CRITTERS AND EGG CARTON CREATURES

Objective: The student will be able to reuse waste from the environment.

Materials:

1. egg cartons
2. empty boxes and containers (anything that would normally be thrown away)
3. glue
4. construction paper
5. pipe cleaners, buttons, other odds and ends

Procedures:

1. Display all materials in a learning center with a colorful sign to stimulate the child's creativity (see next page).
2. Allow the children to make critters and creatures (or anything else they desire) using the materials in the center.
3. After all the children have made something have a "Litter Show and Tell." Make sure the children tell what they used to make their creature or critter.

Indication of Mastery: Completion of one critter or creature.

Variations and Extensions:

1. Have children bring to school other waste materials that they feel would make interesting critters and creatures.
2. Display the critters and creatures in a recycling corner.

Interest Span: 20 - 30 minutes.

Related Subject Areas: Fine Arts, Language Arts

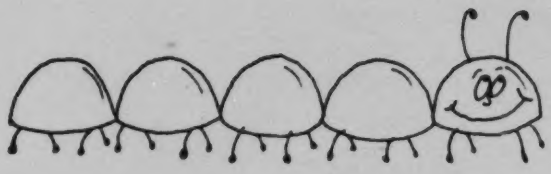
Practical Hints:

1. Make a creature to display by the sign in the center so the children have an example to follow.
2. Stress the idea of reusing materials during the show and tell session.

# Make a "Litter Critter"

# or

# An Egg Carton Creature



# LITTLE AMERICAS

**Objective:** The student will be able to identify ways in which he/she can individually protect the environment.

**Materials:**

1. A medium sized paper bag for each student.
2. Construction paper, glue, crayons.
3. A large area of land (e.g. playground or a park), divided into smaller areas so that each child can be assigned to one small space. Each of these divisions will be called (name of a student) 's Little America.
4. A map of the large area and it's divisions with the name of each individual child written on one area.

**Procedures:**

1. Pass out a paper bag to each student. Explain to the students that these are going to be used as litter bags. Tell the students to print their names on the bags and allow them to decorate the bags as they wish.
2. Show the map to the group of children and point out the specific area each child has been assigned. Explain that these divisions are going to be called Little America's and each of them is the sole member of a Little America.
3. Walk to the site of the group of Little Americas. Bring the map along and have each child find his/her Little America. Tell the children to pick up the litter in his/her Little America.
4. After 15 minutes, call the students together. Dump all the litter in a big pile and form a circle around it.
5. Question students on what they found as individuals and what they found as a group. Make sure to point out that because each person was responsible for his/her own Little America, a large area has been cleaned up. Lead into the conclusion that if individuals all over America were responsible, litter would not be a problem.
6. Dispose of all the trash.

**Indication of Mastery:** Participation in activity and discussion.

**Variations and Extensions:**

1. Use construction paper scraps only. Emphasize ecology by recycling the paper.
2. Allow the children to keep their litter bags to use at home and around school. At the end of the discussion have children name other places they could be responsible for cleaning up.

**Interest Span:** 50-60 minutes

**Related Subject Areas:** Reading, Fine Arts

**Practical Hints:**

1. Divide the area as clearly as possible. Have some object in each Little America area to identify it on the map when the children are trying to find their spots. Use rocks, trees, picnic tables, water fountains and trash barrels.
2. Encourage students to discuss what they found and how they can relate this experience to other situations.

# DON'T THROW IT, RECYCLE IT!

Objective: The student will be able to identify ways in which he or she can individually protect the environment.

Materials:

1. Set up a corner of the room as a mini-recycling center.
2. Make enough bottle tokens, out of construction paper, so there are several per child.
3. Make certificates and badges, one per child, out of construction paper. Use ecology colors of green and yellow.

Procedures:

1. Discuss with the class the importance and uses of a recylcing center. Include a discussion of what items can be recycled.
2. Have students bring in recyclable items to the classroom recycling center. You may want to limit this to things they can find on the school grounds.
3. Give each child a paper bottle token for each recyclable item brought to the recycling center. Such items include: milk cartons, newspaper, tin cans, and egg cartons.
4. At the end of the week, have the students "cash in" their bottle tokens for a certificate and an ecology badge.

Indication of Mastery: Participation in the project.

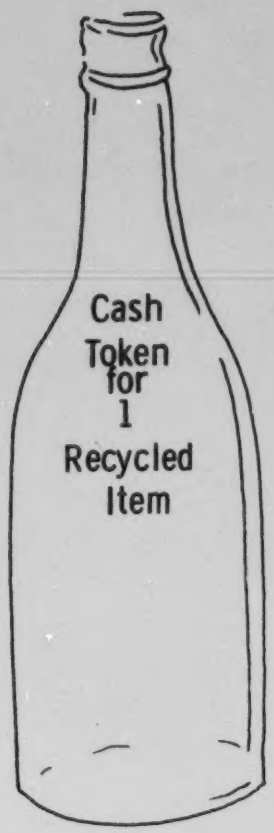
Variations and Extensions: Make the project a school-wide, ongoing activity.

Interest Span: 1 week

Related Subject Areas: Math

Practical Hints:

1. Do not encourage children to bring in bottles or sharp cans.
2. Have children particpate in the activity as a group effort rather than a contest.



This certifies that

_____

has helped save our environment by bringing _____ items to our recycling center.

# FOOD CHAINS

Objective: The student will be able to analyze the interdependence of all living things.

Materials:

1. Chain cards made out of strips of construction paper divided into 4 equal sections.
2. Crayons or markers for drawing.

Procedures:

1. Discuss with the class ways humans are dependent upon other lving things.
2. Divide class into small groups of 3 or 4.
3. Have each group form a cirlce and give each member of the group a chain card.
4. Have the students begin the chain by drawing a picture of the animal in the first box of their chain card.
5. Then each student passes his or her card to the next student who draws and labels a picture of something the first animal eats.
6. Pass the cards again in the same direction so each student has a different card. If the second picture is an animal, the student draws a picture of something that animal eats.
7. Continue to pass the cards until the chains are completed.
8. Compare the results of the class.

Indication of Mastery: Completion of all chain cards.

Variations and Extensions:

1. Chain cards could be made with the given link of the chain somewhere other than the beginning.
2. Blank chain cards could be given for students to try making the longest chain.

Related Subject Areas: Art

Interest Span: 20-25 minutes

Practical Hints:

1. Make some of the chains easy enough so not to discourage the groups.
2. Be sure to explain to the children that this is not a contest or a race. The objective is to complete the food chain with as much originality as possible.

SAMPLE CHAIN CARD

| | | | |
|---|---|---|---|
| MAN | | | |

Examples to use: Man, fish (trout), dog, robin, chicken, cow, duck, deer

# STUMP THE DELIGHTFUL DICTIONARY

Objective: The student will be able to define ecology and related terms.

Materials:

1. A box large enough for a child to fit inside. Decorate the box so it looks like a large book. Title the book "The Delightful Dictionary". Cut a slot below the title for children to insert word cards. See illustration.
2. A set of word cards, each card naming a ecological term that has been previously introduced.
3. Reference list with a definition for each word in the set of word cards.

Procedures:

1. Select one child to be the "dictionary" to sit inside the box.
2. Have another child select a word card to insert in the slot of the box. The person inside the box (the "dictionary") has to define the word in his or her own words. If the "dictionary" can't define the word, the student outside of the box becomes the new "dictionary".
3. Disagreements can be clarified by using the reference book or a real dictionary.

Indication of Mastery: Participation in activity and observation by teacher.

Variations and Extensions:

1. Vary the number of children participating in this activity. Pair work could be used for drill, small group work for review and large group for a game (the winner is the person who defines the most words).
2. Use the "Delightful Dictionary" for reading vocabulary or any other subject where a basic knowledge of vocabulary is important.

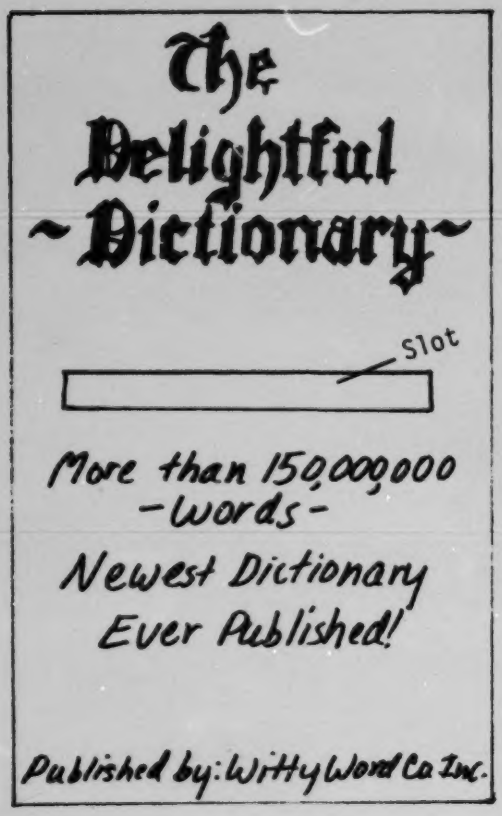
Interest Span: 50 - 60 minutes.

Related Subject Areas: Language Arts, Reading

Practical Hints:

1. Stress to the students that they should be prepared before they go inside of the dictionary. The idea is to stay in there as long as possible without being stumped.
2. Group the students according to achievement so that there is equal opportunity for each child to be inside the dictionary.

Sample Dictionary




Starter list for word cards

1. ecology
2. energy
3. waste
4. pollution
5. recycle
6. litter
7. plant
8. animal
9. earth
10. resource
11. conservation
12. cycle
13. reservoir
14. individual
15. effort
16. smog
17. replaceable resource
18. food chain

# SLASH THAT TRASH

**Objective:** The student will be able to describe and explain the importance of individual effort in effective conservation.

**Materials:**

1. ¼ inch squared graph paper
2. drawing paper
3. crayons or markers

**Procedures:**

1. Keep track of and record the number of wastebasket fulls of trash produced by the class in one week. Have each child make a vertical bar graph on graph paper. Each square represents one wastebasket full of trash (see next page).
2. Discuss ways in which the class as a whole can reduce the amount of trash produced weekly by the class. Compile a list of suggestions and post them in a strategic spot.
3. Allow each child to make a small poster for his/her desk to promote the reduction of trash in the classroom.
4. For one week, using the suggestions compiled by the class, have half the children reduce the amount of trash. Before starting have the children infer and predict how much trash (in numbers of wastebaskets-full) might be reduced. Start experiment and keep track of and record the number of wastebaskets-full of trash. Have each child plot the data on the verticle bar graph. Compare the two bars.
5. Repeat the procedure the following week with the entire class. Encourage the children to infer and predict the amount of trash on the basis of the first weeks results. Keep track of the number of wastebaskets-full and plot the data on the vertical bar graph. Compare the bar with the other bars on the graph.
6. Interpret graphs and discuss results. What can be concluded from the experiment? (The more people involved the more the trash is slashed!) Transfer the concept of involvement from many people to other conservation situations.

**Indication of Mastery:** Participation in activity and completion of graphs.

**Variations and Extensions:**

1. Make this a school-wide project and put the graph on the community bulletin board.
2. Conduct experiment using another aspect of conservation (e.g., reducing the amount of water used.)

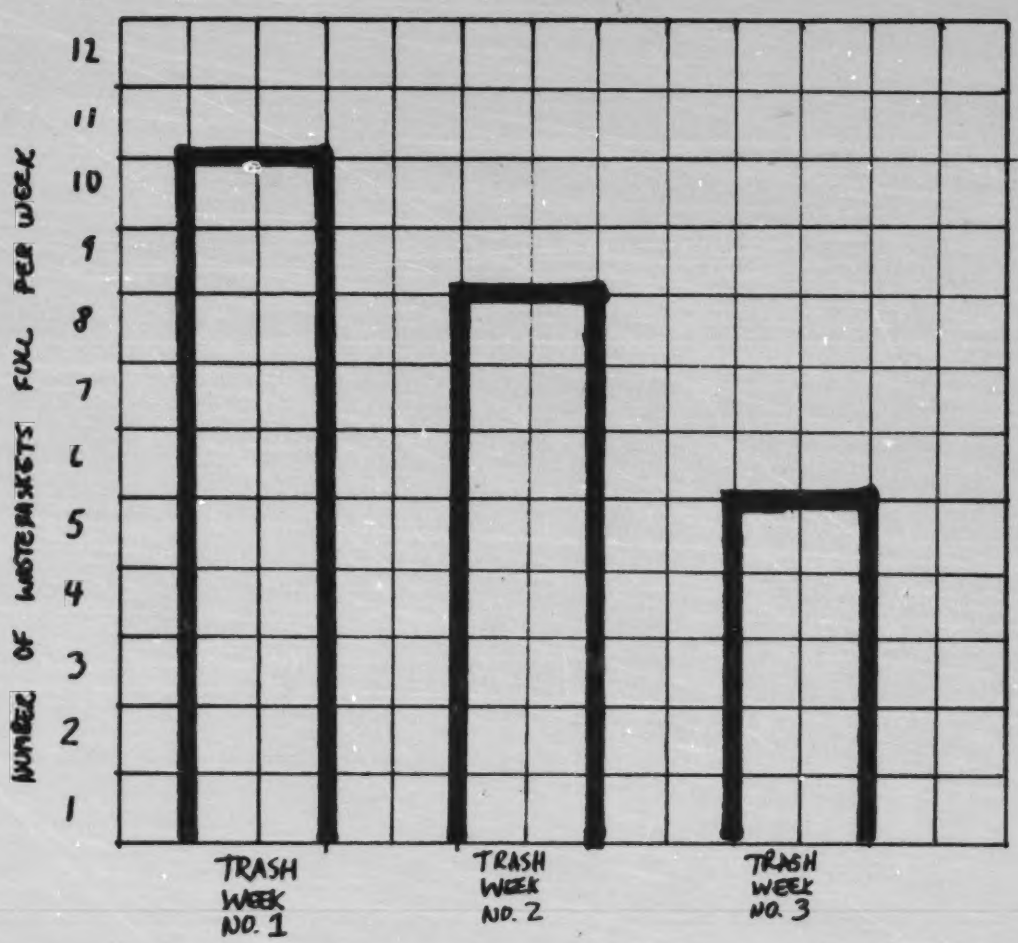
**Interest Span:** Three weeks.

**Related Subject Areas:** Mathematics, Language Arts.

**Practical Hints:**

1. Make sure the data is accurate. Stress exactness and clear this project with the school janitor to avoid inaccuracy.

## SLASH THAT TRASH GRAPH



# I WONDER WHAT WOULD HAPPEN IF...

**Objectives:** The student will be able to infer the effects of the absence of the conditions for life.

**Materials:**

1. A group of students in an area where other groups won't be disturbed.

**Procedures:**

1. Discuss in a teacher-led small group the necessary conditions for life and compile a list on the board.
2. Teach the following verse to the entire group of students (the tune is "Mary Had A Little Lamb"):

   I wonder what would happen if
   happen if
   happen if
   I wonder what would happen if
   There Was (were) no_____

   Explain that the song is incomplete and will be filled by one of the suggestions on the board.
3. Have one child leave the room and select one item from the list. Bring the child back and sing the verse completing it with the selected item. For example the verse could be:

   I wonder what would happen if
   happen if
   happen if
   I wonder what would happen if
   There was no water to drink.
4. The child who left the room then has to infer what would happen if the song was true. (For the above verse the child could infer that we would all be thirsty.)
5. Repeat the song using each item on the list. Make sure each child has a chance to make an inference.
6. When all items have been used, discuss all of the inferences as a group.

**Indication of Mastery:** Participation in activity.

**Variations and Extensions:**

1. Draw pictures or act out inferences.

**Interest Span:** 40-50 minutes

**Related Subject Areas:** Fine Arts, Language Arts

**Practical Hints:**

1. If possible, accompany the song with a guitar, ukelele or piano.
2. If it is hard to fit in the words to complete the song, sing the song up until the ending words and complete the song by just reciting the added words.

Ecology/Observation, Experimenting, Communicating

8-10/Small Group

# SNOW SHOW

Objective: The student will be able to identify three types of pollution in his/her personal environment.

Materials:

1. A small notebook for record keeping for each student involved in the activity.
2. A winter season is needed for this activity.

Procedures:

1. Discuss pollution in the community where the children live. Lead into the idea the pollution can be observed by watching snow over a period of time.
2. Assign an area of snow in the community for each student to observe over a certain period of time. Select areas that will show a contrast in the amount of pollution evident in the snow. Some places that might be observed are:

   a. A busy city street
   b. a hill where children play
   c. the yard of a home with a dog or cat
   d. a secluded yard or park
   e. an alley

3. Require the students to observe their assigned areas daily and to keep a daily log of observations. The experiment should start at the time of a snow fall and end at the next snowfall.
4. Compare logs of all selected areas. Try to get the children to bring up reasons why one area of snow shows more evidence of pollution than another.

Indication of Mastery: Participation in activity and completion of log.

Variations and Extensions:

1. Collect samples of some snow from selected areas daily. Put in jars and record the date the sample was collected on the jar. Observe jars and see what remains in the jar after the snow melts.

Interest Span: two weeks

Related Subject Areas: Language Arts.

Practical Hints:

1. If snowfalls are too close together discontinue the experiment until there is enough time for pollution to show up. It will be better and more evident to the children if a lot of contrast is shown.
2. Assign areas to the children according to the location of their homes. Make this an activity that they can easily do on their way to and from school.

# SIGNS OF POLLUTION

Objective: The student will be able to identify three types of pollution in his/her personal environment.

Materials:

1. A bulletin board to set up as a learning station (see next page).
2. Three pictures, each representing a type of pollution: air, water, earth.
3. Construction paper.
4. "Sign card" - at least 15 for each type of pollution. These are made from tagboard cut into pieces approximately 4 x 4 inches.
5. Each "sign card" should have written on it a phrase or sentence which corresponds to one of the three types of pollution. (see sample)

Procedures:

1. Have children work individually or in pairs.
2. Have the students sort the "signs" and put them in a slot under the category of pollution the sign depicts.
3. If the students work in pairs they can check each other; individuals should have someone check them.

Indication of Mastery: Completion of activity.

Variations and Extensions:

1. Build a self-check system into the activity by marking the backs of each card, using a different color to represent each type of pollution.
2. When children become more familiar with ecology, add other or more specific categories of pollution.

Interest Span: 20 minutes

Related Subject Areas: Art

Practical Hints:

1. Make the sign cards as unique and different as possible to assure interest.
2. Change signs when all children have participated in activity.

SIGNS OF POLLUTION - cont.

SAMPLE BULLETIN BOARD:

POLLUTION EVERYWHERE

| Air | Water | Earth |
|---|---|---|
| (Picture of air pollution) | (Picture of water pollution) | (Picture of Littering) |
| ---------- | ---------- | ---------- |
| ---------- | ---------- | ---------- |
| ---------- | ---------- | ---------- |
| ---------- | ---------- | ---------- |

Slots, using strips of construction paper, stapled to bulletin board.

SAMPLE SIGN CARDS:

Oops! I tripped over a soda can

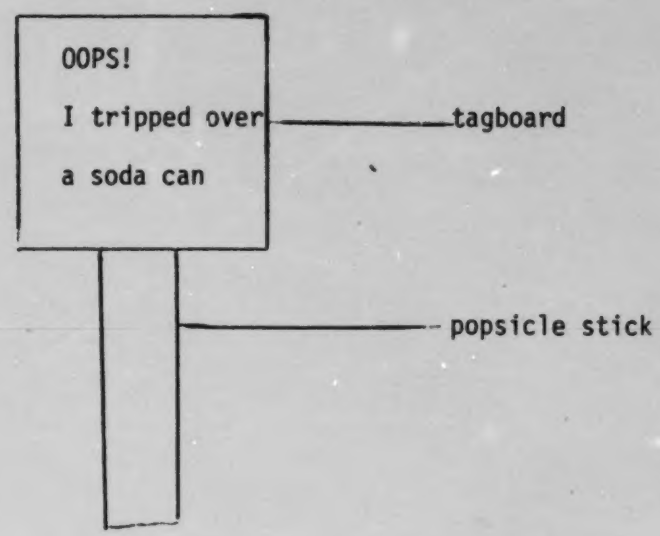
Sorry! No swimming here.

Don't drink the water.

Please wear gas mask!

What's in that aerosol can?

To playground: Follow trail: papercup, napkin, soda can, cup.....



# I SAVE BY...

Objective: The student will be able to state what he/she is doing at home and at school to save the environment in his/her own community.

Materials:

1. Large sheet of paper (e.g., 2 meters by 1 meter) taped to wall with "I SAVE BY . . ." at the top.
2. Crayons or markers.

Procedures:

1. During homeroom period or at the beginning of science class, take 5-10 minutes to let students write briefly on the large paper how they have helped protect the environment and explain why.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Extend project to other groups, perhaps even schoolwide.
2. Illustrate what they have done with drawings.

Interest Span: Once daily for a week.

Related Subject Areas: language arts.

Practical Hints:

1. Use durable paper so it will not break or tear.
2. Set a specific time each day for the activity and for the length of the entire project.

# THE MISSING LINK

Objective: The student will be able to predict the consequences of a broken food chain.

Materials:

1. Five diagrams of the food chain on transparencies (see next page). One diagram will be a complete illustration of the food chain, the other four will each have a different item in the food chain missing. This missing item will be called "The Missing Link". See sample food chain.
2. Overhead Projector.

Procedures:

1. Project the transparency of the complete food chain. Have the students give examples of each of the four items on the chain. In addition, name animals that are both plant and meat eaters.
2. Turn off the overhead projector. First, talk about metal chains, their uses and how they hold things together. Then, compare this to the food chain and how it holds together the balance of nature. Lead into the ideas that when chains are broken or a link is missing they no longer will hold things together.
3. Project the other transparencies one by one and refer to the missing items as "The Missing Link" in the chain. Have the children discuss and infer the consequences of the missing link of each transparency.
4. Have the children formulate questions and hypotheses of possible reasons for the missing link in each transparency.

Indication of Mastery: The student will infer the consequence of each "missing link" in written form with 80% accuracy.

Variations and Extensions:

1. Allow students in a student-led group of 4 or 5 to discuss the transparencies. Each student selects one transparency and explains it to the rest of the group.

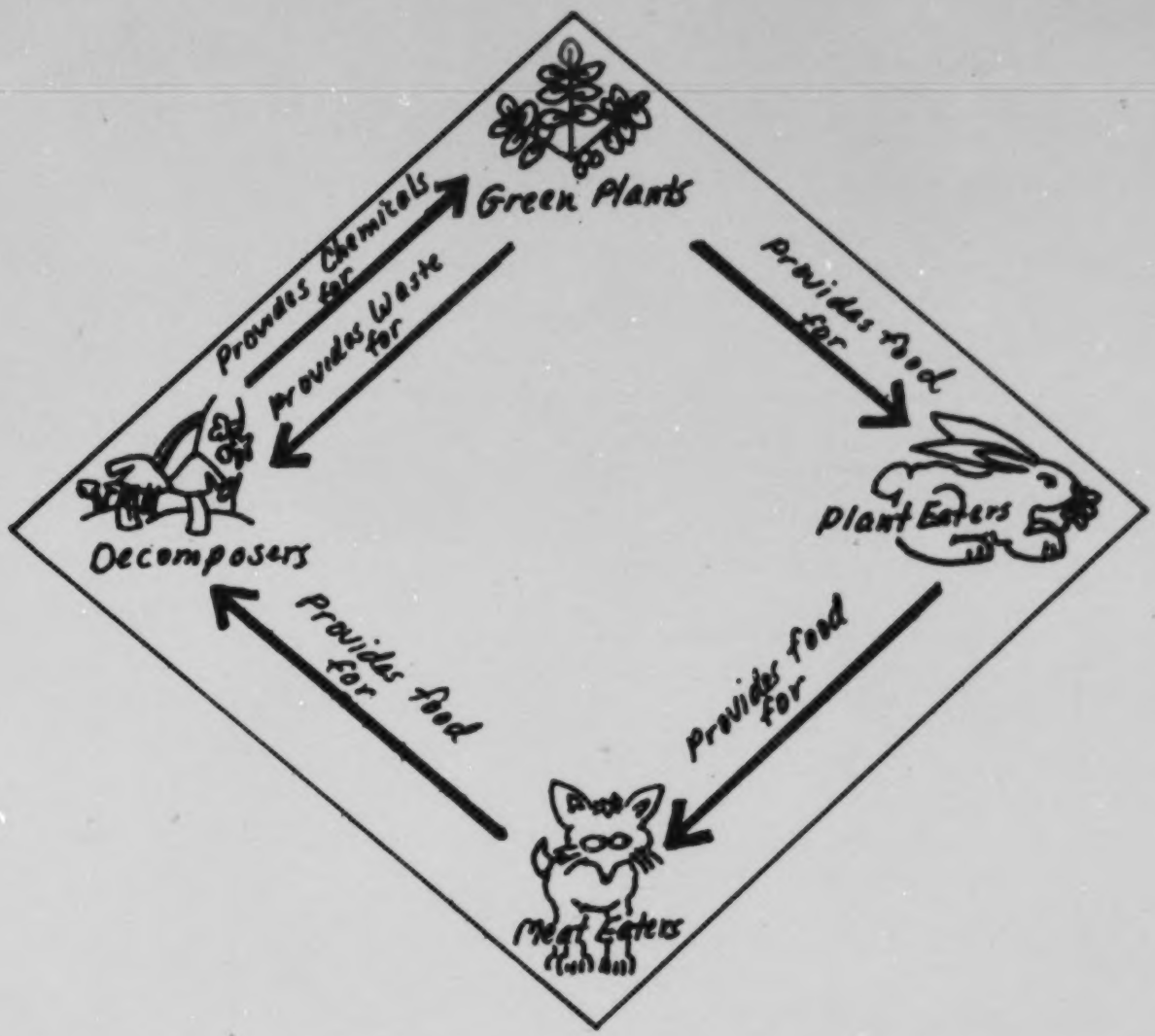
Interest Span: 20 - 30 minutes.

Related Subject Areas: Language Arts, Reading

Practical Hints:

1. Make sure the transparencies are clear enough to be read easily. The transparencies would be more attractive if done in color and by using pictures of each item on the chain.
2. Encourage all children to take part in the discussion.

## SAMPLE FOOD CHAIN DIAGRAM



# ANIMAL EDIBLES

Ecology/Classification
Modeling
10-12/Independent

Objective: The student will be able to describe the food chain and construct a model of the food chain by selecting an animal and tracing its food source.

Materials:

1. Old magazines that are likely to contain pictures of animals.
2. A 1-meter square piece of tagboard
3. yarn
4. rubber cement
5. magic markers
6. reference books

Procedures:

1. Hand the student a magazine and have him or her cut out the picture of the first animal he or she sees.
2. Without looking at a diagram of a food chain (such as the one used for "The Missing Link") have the student find out where this animal fits in the food chain. Reference books are available for this purpose.
3. The student can construct a model of the food chain that includes his or her animal by pasting or drawing pictures of the living things in the change and labeling them (meat eater, plant eater, green plant decomposer). Next the student should connect the pictures with yarn and label the steps in the chain.
3. Compare food chain models made by various students.

Indication of Mastery: Completion of the food chain model with 75% accuracy.

Variations and Extensions:

1. Display completed food chain models.
2. Observe one of the animals on one of the model food chains. Does it eat what the model says it does?

Interest Span: 40 - 50 minutes.

Related Subject Areas: Fine Arts, Language Arts

Practical Hints:

1. Make sure rubber cement is used to paste magazine pictures. It will not wrinkle the paper.

# ENERGY WIZARDS

Objective: The student will be able to list the different energy sources and which are available, usable and non-polluting.

Materials:

1. Set of laminated, 5" x 7" question/answer cards. The questions and answers are as follows:

   a. What is water?--a natural energy source that is limited because dams cannot be constructed in all places.

   b. What is wind?--a natural energy source that is unpredictable and can be hooked up using a windmill.

   c. What is the sun?--a natural energy source that is unpredictable and produces heat.

   d. What is nuclear energy?--a man-made energy source that heats large amounts of water and leaves contaminated waste.

   e. What is natural gas?--a fossil fuel that burns very clean and is non-polluting.

   f. What are oil and coal?--two fossil fuels that are limited and cause pollution.

   g. What are heating oil and gasoline?--two fuels that are made from oil.

   h. What is electricity?--a man-made energy source that used water, wind, or fossil fuels.

Procedures:

1. Stack the cards so that the answers are face-side up.
2. Show an answer to a child in a small group. Have him or her formulate a question for that answer. If the child is correct, he/she gets one point.
3. Give each child equal opportunities to formulate questions. Keep track of the number of points each child obtains and after an alloted time span declare the child with the most points the "Energy Wizard".

Indication of Mastery: Each child will formulate questions with 80% accuracy.

Variations and Extensions:

1. Reverse the activity by showing the questions and asking for the answers.
2. Let the children work in pairs and drill each other on formulating questions.

Interest Span: 30-40 minutes.

Related Subject Areas: Language Arts, Reading.

Practical Hints:

1. Group the students according to achievement so that all children experience success.
2. Be flexible in acceptance of students' questions.

# A DAY IN THE LIFE OF AN ENERGY CONSERVER

Objective: The student will be able to list and explain ways in which an individual can conserve energy.

Materials:

1. One cassette or reel-to-reel tape for each small group of students.
2. Tape recorders/players.

Procedures:

1. Have each small group (3-5 students) of students involved in the activity choose one person, according to an occupation, that could be of prime importance in conserving energy.
2. Have each group create and record a script on a day in the life of this person that illustrates ways in which energy can be conserved. Each script should be introduced on the tape as "A Day in the Life of a (milkman), an Energy Conserver."

Indication of Mastery: Completion of script and tape.

Variations and Extensions:

1. Make puppets to go along with the tape of the script.
2. Act out the script.

Interest Span: Two weeks.

Related Subject Areas: Language Arts, Reading

Practical Hints:

1. Make sure all of the children know how to work the recording equipment and know the essentials of good tape recording.
2. Provide opportunities to share the tapes with other students of the same and different age levels.

# WANDA THE WATER WITCH AND EGORE ELECTRICITY

Objective: The student will be able to describe the importance of conserving water and electricity and indicate ways in which they can be conserved in the home.

Materials:

1. Laminated 11" x 14" Wanda the Water Witch and Egore Electricity cards (see next page).
2. Felt tipped pens.
3. Cloth to use as an eraser.

Procedures:

1. Discuss why it is important to conserve water and electricity.
2. Allow individual students to complete and correct Wanda the Water Witch and Egore Electricity Cards.

Indication of Mastery:

1. Participation in discussion and completion of card with 80% accuracy.

Variations and Extensions:

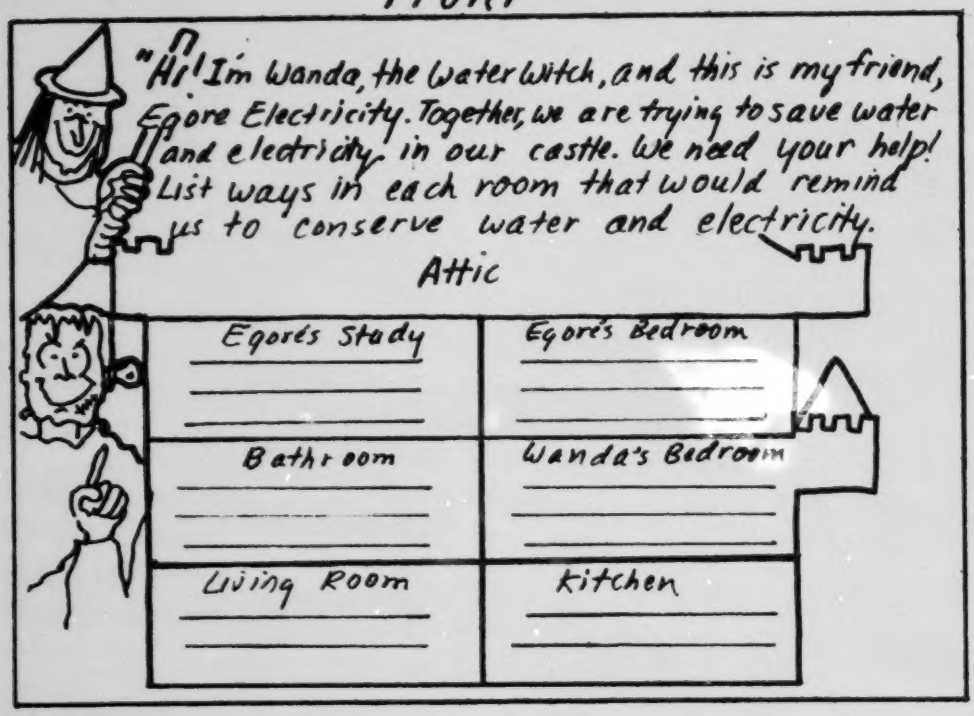
1. Have students make their own cards listing ways in which gasoline, natural gas, and heating oil can be conserved.
2. Make cards larger so that the students can draw pictures illustrating how it is possible to conserve water and electricity.

Interest Span: 30-40 Minutes.

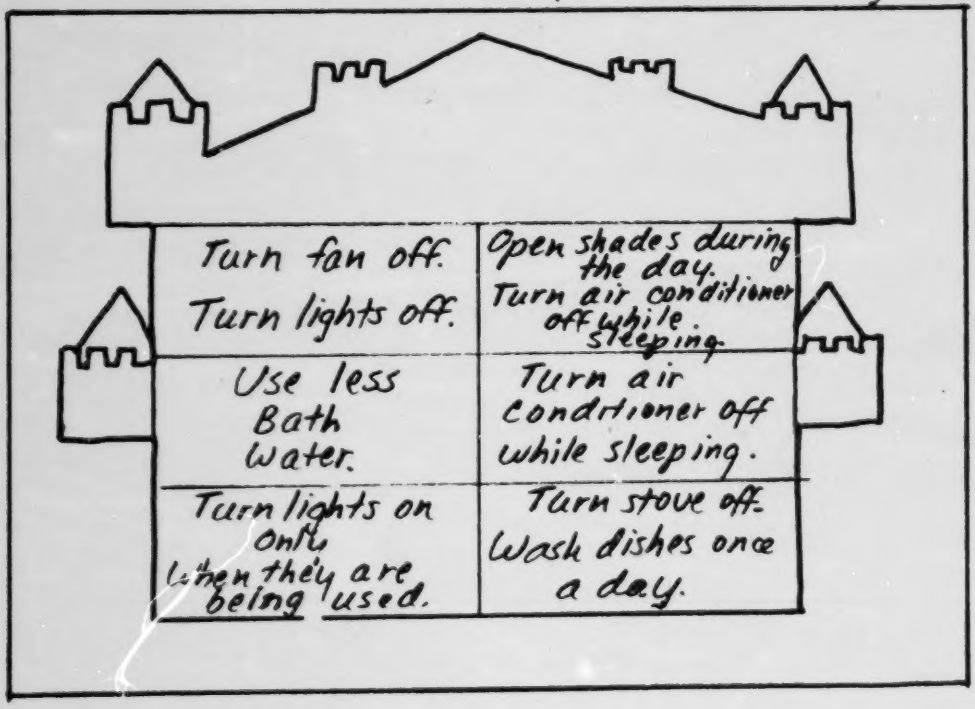
Practical Hints:

1. Provide sufficient background on the concepts of water and electrical waste before using this activity.

## Front


"Hi! I'm Wanda, the Water Witch, and this is my friend, Egore Electricity. Together, we are trying to save water and electricity in our castle. We need your help! List ways in each room that would remind us to conserve water and electricity.
Attic
Egore's Study
Egore's Bedroom
Bathroom
Wanda's Bedroom
Living Room
Kitchen

## Reverse (Possible Answers)


Turn fan off.
Turn lights off.
Open shades during the day.
Turn air conditioner off while sleeping.
Use less Bath Water.
Turn air condrtioner off while sleeping.
Turn lights on only when they are being used.
Turn stove off.
Wash dishes once a day.

# BEFORE AND AFTER

**Objective:** The student will be able to infer the cause of ecological pollution and will be able to predict what will happen if the cause continues to exist.

**Materials:**

1. Before and After strips made as follows:
   a. Cut strips of drawing paper 12" x 4".
   b. Fold each strip of paper into fourths, accordian style, along the longer edge.
   c. Draw a picture of an unpolluted scene in the first space on the left side and label it "before". In the last space on the right draw a picture of the same scene after it has been polluted in some way. Label this space "after". For example, the "before" space could contain a drawing of a clean park and the "after" space show a drawing of the same park after a considerable amount of littering.
   d. Leave the two middle squares blank. Clip together the fold between the blank spaces with a paper clip. This will form a paper stand and the "before" and "after" spaces will be side by side.
2. Crayons, pencils or markers.

**Procedures:**

1. Hand out a "Before and after" strip to a student to look at and study. Tell him/her to look at the two pictures and try to imagine or infer what happened to cause the difference in the two pictures.
2. Have the student remove the paper clip and draw in the two blank spaces what could have caused the difference between the two pictures.
3. Next, tell the student to imagine what the scene would look like a month later if the causes he imagined or inferred still existed. Have him or her illustrate the prediction on the reverse side of the after space.

**Indication of Mastery:** Completion of "before and after" strip.

**Variations and Extensions:**

1. Supply the strips without any pictures and let the children create their own "before" and "after"pictures. Have them exchange the strips with a friend. After the friend completes the strip have them discuss the inferences and predictions together.
2. Duplicate the strips and give the same strip to each child in a large or small group. After everyone completes the strip, compare and contrast each individuals inferrences and predictions.

**Interest Span:** 50 to 60 minutes

**Related Subject Areas:** Language Arts, Fine Arts.

**Practical Hints:**

1. Use this after pollution has been discussed so the children have some background on which to base their inferrences and predictions.
2. Display the strips after they have been completed.

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BEFORE AND AFTER STRIPS

Ecology/Interpreting Data
Inferring, Predicting
10-12/Independent

# GARBAGE GRAPH

Objective: The student will be able to explain the reason for recycling trash.

Materials:

1. A copy of the "garbage graph" (see next page) for each student.
2. Paper and writing instruments.

Procedures:

1. Give each student a copy of the "garbage graph". Provide time for study of the graph.
2. Ask the students to interpret the graph and infer what problems may result from the present day methods of garbage disposal. In addition, have them predict solutions to the problems that they discover. (Hopefully, one discovery will be that a cheap, efficient methods of recycling could solve the problem.)
3. Allow the students to pursue this problem using any outside materials that are available.

Indication of Mastery:

Completion of a written interpretation of the graph and possible solutions. The participant and the instructor will agree on mastery.

Variations and Extensions:

1. Project the "garbage graph" on a transparency and discuss the interpretations and solutions as a group.

Interest Span: 50-60 Minutes.

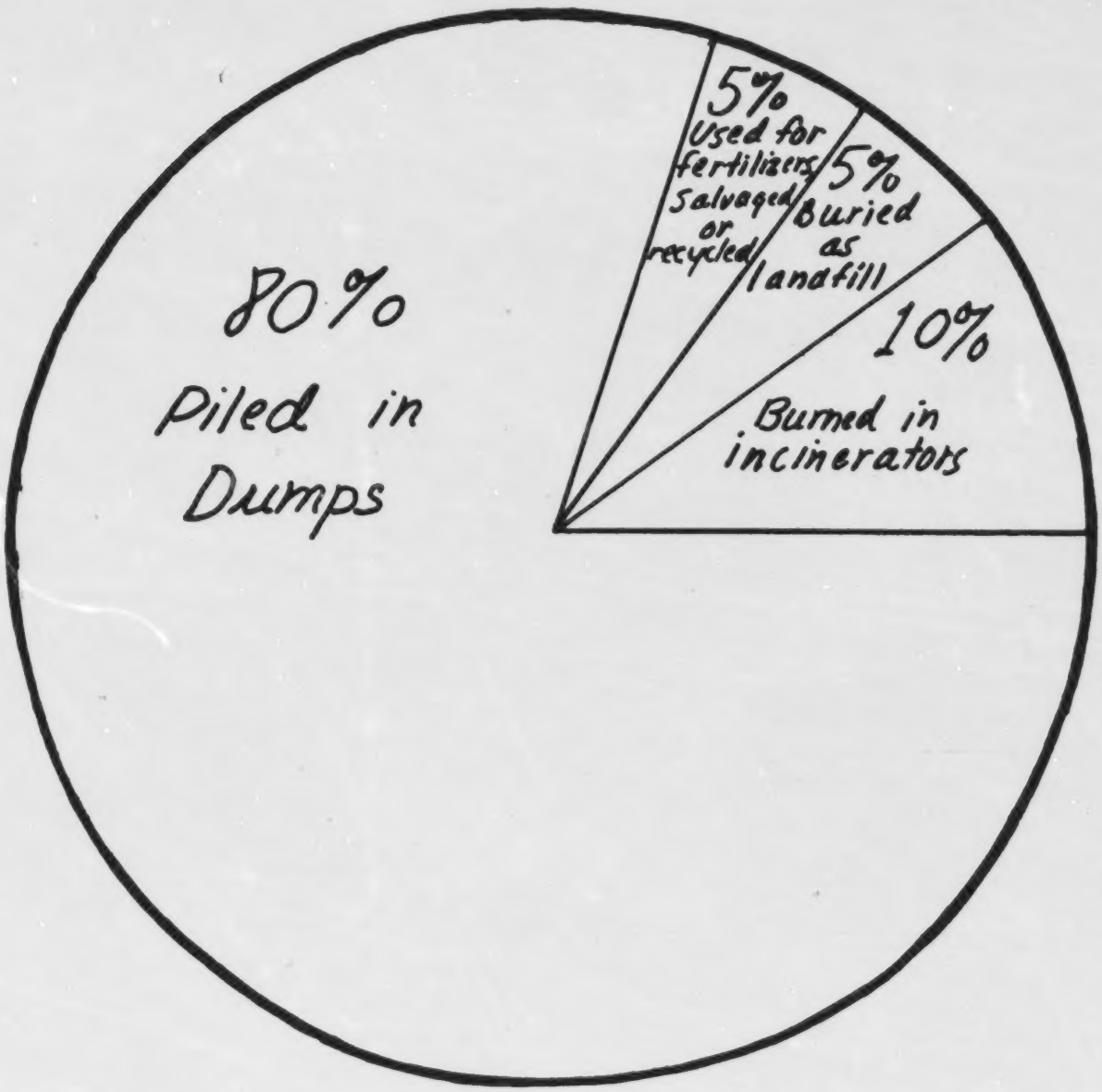
Related Subject Areas: Mathematics, Language Arts.

Practical Hints:

1. Accept only solutions that are logical and well-thought out. The purpose of this activity is to get the students to think on their own.

# GARBAGE GRAPH

This graph shows how we are presently taking care of the 360,000,000 tons of trash produced yearly. Look at each section of the graph and determine what problems might come about because of this method of disposal and how you would solve the problem.



Ecology/Classification
10-12/Small Group

# ENERGY TARGETS

Objective: The student will be able to classify items as to whether they conserve or use energy.

Materials:

1. Energy target (see next page) pinned to a 2' x 2' piece of styrofoam.
2. Four or five darts.
3. Paper, marking pens, additional 2' x 2' piece of styrofoam.

Procedures:

1. Allow three or four students to play Energy Target by throwing darts at the board. Players take turns throwing two darts. They keep track of their own scores.
2. After the students have played the Energy Target presented here, have them design another target. They should be instructed to follow the same format but not to copy any item from the original. Stress the fact that items that conserve energy add points to the score and items that use energy subtract points from the score. In addition, point out that the higher points on the target are in the center and that the higher items are of major importance in conserving or using energy.

Indication of Mastery: Participation in Energy Target game.

Variations and Extensions:

1. Conduct an "Energy Target" tournament using all of the student-created boards. Provide lots of opportunities for the children to see their creations in action.
2. Allow the children to adapt energy conservation to other games such as spinning or board games.

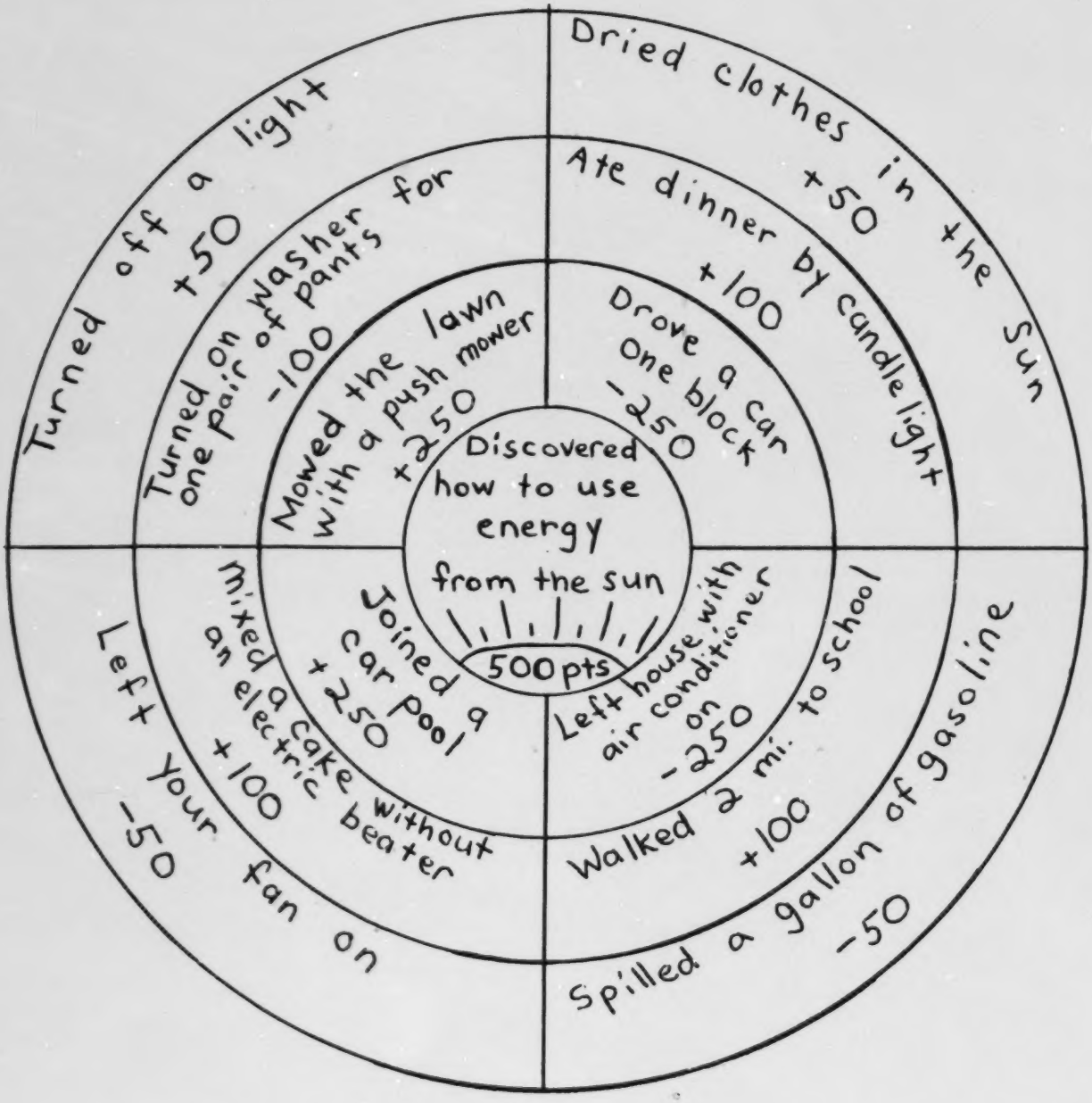
Interest Span: 60-90 Minutes.

Related Subject Areas: Reading, Writing.

Practical Hints:

1. Make sure the printing on the target is large enough to be seen from a distance. Clothback the paper before pinning it on the styrofoam to increase the durability.

# ENERGY TARGET


Dried clothes in the Sun +50
Ate dinner by candlelight +100
Drove a car one block -250
Left house with air conditioner on -250
Walked 2 mi. to school +100
Spilled a gallon of gasoline -50
Left your fan on -50
Mixed a cake without an electric beater +100
Joined a car pool +250
Mowed the lawn with a push mower +250
Turned on washer for one pair of pants -100
Turned off a light +50
Discovered how to use energy from the sun
500 pts

# POLLUTE CHUTES AND LADDERS

Objective: The student will be able to classify an item as to whether it conserves or pollutes the air.

Materials:

1. "Pollute Chutes and Ladders" game board (see next page).
2. Four or five buttons for playing pieces.
3. One die.

Procedures:

1. Each child selects one playing piece and puts it on the "start" space.
2. Each child rolls the dice and the one with the lowest number is the first player. The second player is the one on the right side of the first player, etc.
3. The player selects the top card of the pile and determines whether that item conserves or pollutes the air.
4. If the player answers the question correctly, he/she moves to the nearest space that is colored blue (for conserves) or red (for pollutes). Some of the conserve and pollute spaces will include directions like "move back two spaces". The player is to follow these directions and start his/her turn from that point. If a player answers incorrectly he/she loses a turn.
5. If a player lands on a chute space that starts a chute, he/she has to go down to the end of the chute and continue advancing forward from the space at end of the chute. If a player lands on a space with a ladder, he/she can move the playing piece to the top of the ladder and continue on from there.
6. The winner is the first child to make it to the "home" space.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Discuss the game board. Which items are at the top of chutes? (Items that contribute to air pollution.) Which items are at the bottom of ladders? (Items that conserve the air.)
2. Have students construct their own "Pollution Chutes and Ladders" board by changing directions on each space.

Interest Span: 30-40 minutes.

Related Subject Areas: math

Practical Hints:

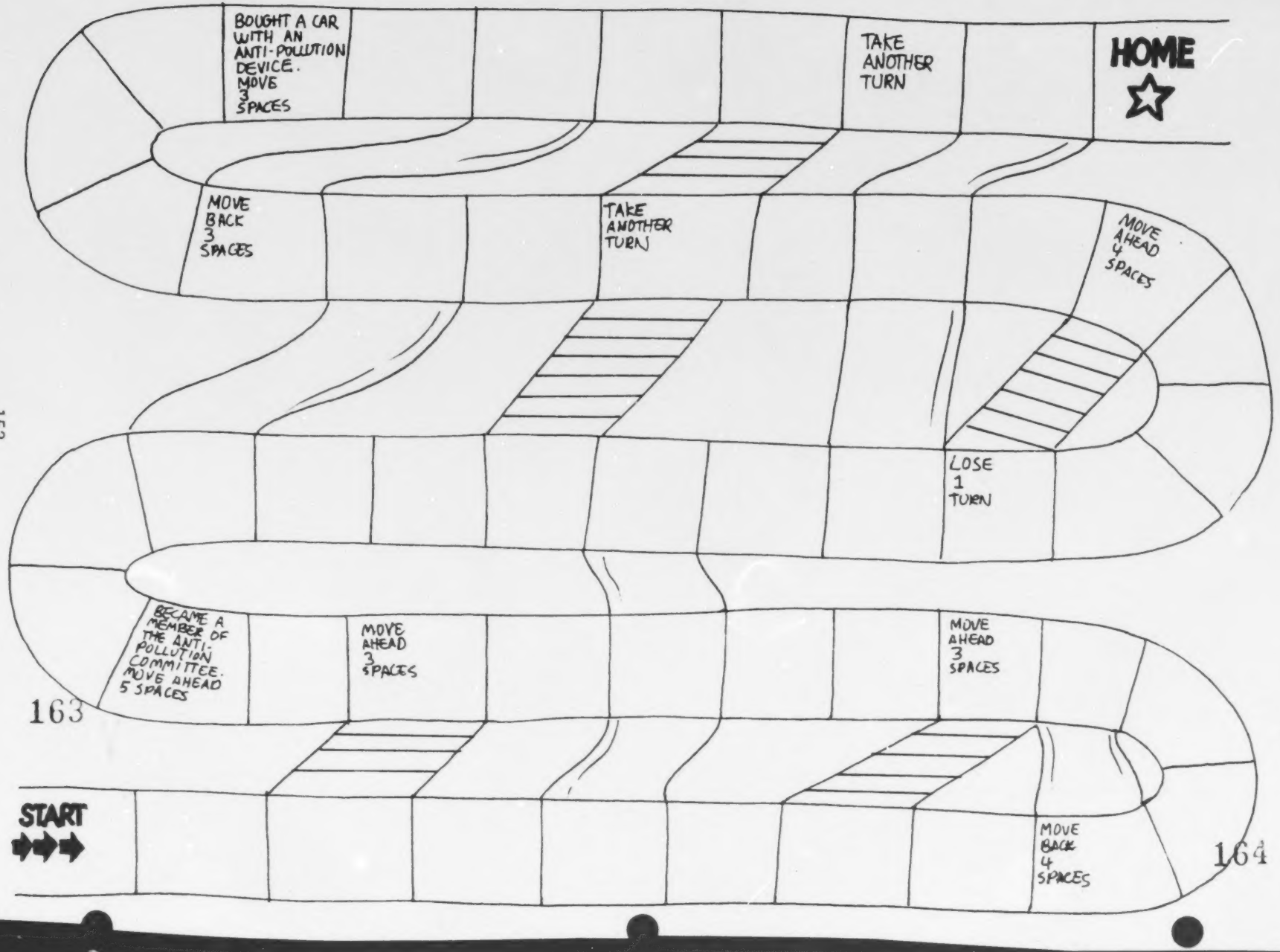


1. Laminate game board for durability.
2. Make sure the playing pieces are different colors or shapes to avoid confusion.

## QUESTIONS FOR CHUTES AND LADDERS

1. Kept car tuned-up to reduce hydrocarbon emission.
2. Left lights on before going to bed.
3. Lowered the thermostat at night.
4. Joined a car pool.
5. Rode a bike instead of driving a car when possible.
6. Bought a six-pack of Coke with throw-away cans.
7. Used non-biodegradable soap on a camping trip.
8. Let the car engine idle while waiting for John to get ready.
9. Always threw away brown paper bag after finishing lunch.
10. Insisted on using a grocery bag for a few items that are already in a container.
11. Turned on the water before starting to brush teeth.
12. Threw away an old bike without trying to repair it.
13. Drove the car to work instead of taking the bus.
14. Sprayed the apple tree with a worm-killer compound on a windy day.
15. Bought a car with a non-pollutant device.
16. Bought milk in returnable bottles.
17. Left the TV on while taking a bath.
18. Used three paper towels instead of one while cleaning up after an art project.
19. Threw paper wrappers on the playground.
20. Left the picnic area with the paper plates still on the table.
21. On a camping trip, threw the left-over grease in the river.
22. Kept the refrigerator door open while trying to decide what to have for dinner.
23. Walked to the grocery store for a few items.
24. Purchased a deodorant in a non-aerosol can.
25. Used a cloth napkin instead of a paper napkin at the dinner table.
26. Placed all used paper in a recycleable container at school.

# POLLUTE CHUTES AND LADDERS BOARD



# PLANT POLICE

Objective: The student will be able to list the ways in which plants assist in protecting the environment.

Materials:

1. Lined writing paper and pencils.
2. Construction paper, scissors and glue.

Procedures:

1. Tell the members of a small group to finish and discuss the following statement, "Just as police are sometimes called on to protect people, people are called to protect plants because plants...". Appoint one student in the group to act as a secretary to record a list of suggestions. The discussion should lead to the following conclusions:
   a. plants prevent erosion and protect the soil.
   b. plants protect the natural beauty of the environment.
   c. plants absorb carbon dioxide from the air and release the oxygen for man and other animals.
2. After the list is compiled and approved by the teacher, each individual student is asked to design a "plant police badge" using one item on the list. Students may have to do more than one badge or the same as another student according to the number of students in the group.

Indication of Mastery: Participation in discussion and completion of one badge.

Variations and Extensions:

1. Have students create a play titled "A Day With the Plant Police Force". Stress the fact that they are to include all items on the list.
2. Set up a plant police station as a booth for an open house.

Interest Span: 30-40 Minutes.

Related Subject Areas: Language Arts, Fine Arts.

Practical Hints:

1. Stimulate creativity by allowing the children to make the badges in any shape.
2. Make sure children include all of the ways plants protect the environment. Allow the children time for research if they need it.

# THE POLLUTION REVOLUTION

Objective: The student will be able to communicate the assets of ecology.

Materials:

1. Large working area (normal-sized class area) divided into smaller areas according to the number of small groups of students.

2. Individual materials to be provided according to the needs of the students.

Procedures:

1. Provide students with a list of topics on ecology and pollution. Allow the students to choose a topic of interest for research. Also allow the children to work as individuals, partners or small groups.

2. After the children have chosen topics and formed groups, hand out a contract (see next page). These are to be filled out by each group and approved by the teacher.

3. Set a time limit on the project (i.e., two or three weeks) and have each group present their topic at the end of the time period. It is a good idea to set aside a week or so and announce it as "The Pollution Revolution." Students should be encouraged to present their topic as creatively as possible utilizing such things as posters, panels, demonstrations, exhibits, mock radio and TV shows, and plays.

Indication of Mastery: Completion of contracts.

Variations and Extensions:

1. Present the "Pollution Revolution" to other students in the school or to parents at an open house. The children should have a chance to communicate to larger groups of people what they have learned about the importance of ecology.

Interest Span: Two to three weeks

Related Subject Areas: Reading, Social Studies, Language Arts, Fine Arts

Practical Hints:

1. Be flexible in the carrying out of the contracts. Allow changes according to unexpected results or unavailability of resources.

2. Personalize this activity by encouraging team work and a common goal of finding out more about ecology and passing it on to others. The title of the activity could be changed to "The Unit B Pollution Revolution" or "Our Pollution Revolution".

## THE POLLUTION REVOLUTION CONTRACT

TOPIC _____

NAME OF STUDENT(S) _____

_____

_____

PLAN FOR FINDING OUT MORE ABOUT THE TOPIC _____

_____

_____

_____

_____

TIME NEEDED _____

TITLE OF PRESENTATION _____

TYPE OF PRESENTATION _____

DATE OF PRESENTATION _____

SIGNATURE OF TEACHER _____

SIGNATURE OF STUDENT(S) _____

_____

_____

_____

# FAR-OUT FURNITURE

Objective: The student will be able to demonstrate a creative, individual method of recycling.

Materials:

1. Empty pop cans collected by the students.
2. An adhesive strong enough to hold the cans together.
3. "Far Out Furniture" contracts. (see next page)

Procedures:

1. Discuss in a large group creative ways of recycling such as making toys, plant holders, pencil jars, Christmas decorations, and so on.
2. Explain to the students how pop cans have been recycled by stacking and them to become pieces of furniture.
3. Divide class into small groups (four to five students each) and have them develop and carry out a plan for making a piece of "pop-can" furniture.
4. Have each group fill our a "Far Out Furniture contract" before making the furniture. Stress that it must be approved by the instructor.
5. Display the completed pieces of "Far Out Furniture."

Indication of Mastery: Completion of "Far Out Furniture Contract".

Variations and Extensions:

1. Extend the idea of creative, individual recycling of having students develop original ideas to recycle other waste materials.
2. Have students make other objects out of pop cans or other waste materials.

Interest Span: 2 to 3 weeks.

Related Subject Areas: Fine Arts.

Practical Hints:

1. Encourage the students to take time in developing the plans and to be creative as possible. For instance, a piece of furniture could have a specific design by alternating different brands of pop cans.
2. Make sure the adhesive is durable enough to hold the cans together.
3. While the students are collecting the cans have them store the cans at home.
4. Provide ample space for working on the furniture and stress the importance of team effort and pride in getting the job done. Do this outside on a nice day.

## FAR OUT FURNITURE CONTRACT

Piece of furniture being made (check one)

____table

____chair

____foot stool

____couch

____other (name it)_____

Estimated Number of Pop cans needed_____

Estimated Length of Time needed to collect cans_____

Signature of Students

_____

_____

_____

_____

Signature of Teacher

_____

Ecology/Classification
Interpreting Data
10-12/Small Group

# RUBBISH RACE

Objective: The student will engage in an ecology program in his/her community and collect and graph the items collected.

Materials:

1. Large storage areas for rubbish.
2. Containers for rubbish.
3. Large sheet of paper and markers for making a graph.
4. Recycle buttons. (See example on right.)

Procedures:

1. Divide the class into two teams or have a different class engage in the activity simultaneously.
2. Have the students decide what type of rubbish they will collect, where they will collect and store it, how they will count it and suggest a given time period for the project and how they will recycle it.
3. Have each team or group, on a daily basis, graph the specific amount and kinds of items collected in each area.
4. Discuss and interpret the data. For example:
   What can we conclude when so many people use paper?
   How can we be better conservers of our environment?
5. Pass out recycle buttons to each group.

Indication of Mastery: Participation in the activity.

Variations and Extensions:

1. Have the rubbish race school- or city-wide.
2. Collect only one type of rubbish and infer and predict what the outcome will be over a given period of time.

Interest Span: To be decided upon by teacher(s).

Related Subject Areas: math, language arts

Practical Hints:

1. Set specific guidelines for the project such as the following: days the rubbish may be brought to school, the time it will be counted, etc.

# AIR POLLUTION CONCENTRATION

Objective: The student will be able to list causes of air pollution and its effect on the environment.

Materials:

1. 18, 4 x 6 cards. Each card will have printed on it either the name of an air pollutant or the effect of an air pollutant on the environment. The following should be included:

| Air Pollutant | Effect of Pollutant |
|---|---|
| fine particles from unburned fire or dust | soils clothing, reduces visibility |
| sulfur dioxide from burning coal in factories | "creates "London-Type Smog" corrodes materials, irritates living organisms |
| carbon monoxide from automobile exhausts | interferes with respitory system in human body. |
| reactants from automobile exhausts | causes eye irritation and damage |
| total oxidants | causes eye irritation and damage to buildings, statues, etc. |
| radioactive pollutants from nuclear testing | great variety of damage to human body |
| carbon dioxide | increases day-time temperature and may influence weather |
| aeroallergens (ragweed) | disrupts health of many people |

Two wild cards should also be included among the cards to increase student interest and motivation.

Procedures:

1. Lay all the cards facedown.
2. Allow a small group of children to take turns turning up cards in order to match the air pollutant with it's effect on the environment. If a child does not turn up a pair, the cards are to be turned face down again in the same position.
3. A wild card matches anything for a pair.
4. Play continues until there are no matching pairs left. The player with the most pairs is the winner.

Indication of Mastery: Completion of activity with 80% accuracy.

Variations and Extensions:

1. Allow individual children to use the cards. Tell him or her to match the causes with the effects and to show the cards to you or a tutor.

Interest Span: 20-30 minutes.

Related Subject Areas: Reading

Practical Hints: Laminate the cards for durability.

Ecology/Inferring, Predicting
Communicating
10-12/Independent

# THE GOOD OLD DAYS

Objective: The student will be able to infer what the environment was like before pollution existed.

Materials:

1. "Good Old Days" interview form. (see next page)
2. Pencils or pens

Procedures:

1. Discuss pollution and the damage it has done or can do. Cite specific examples in the community.

2. Discuss what the environment would be like if there was no pollution. Infer what it was like before pollution came about and what advantages there were before some of our natural resources were endangered.

3. Have each student (or groups of students) select one senior citizen in the community or elsewhere that would be able to give information on the enviro-ment before it was polluted.

4. Using the Good Old Days Interview Form as a guide, have each student interview the people selected. Encourage the children to be polite, friendly, and to try and go beyond the form for more information.

5. Compare results of the interviews of each student. Give each student a chance to share what he or she found. In addition, compare the inferences made before the interviews took place to the information found.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Have a senior citizen come into the class and talk about the environment in the past and stress disadvantages as well as advantages. For instance, factories today produce many conveniences that were not available previously, but they also contribute to pollution.

2. Have the students draw a picture illustrating information from the interview and compare it to the environment now.

Interest Span: One week.

Related Subject Areas: Social Studies

Practical Hints:

1. Encourage the children to select people they know well to interview and make sure thank you notes are sent out.

GOOD OLD DAYS INTERVIEW FORM

1. What kinds of pollution are evident today that were not evident when you were my age?_____

_____

_____

_____

2. What are the advantages of an unpolluted environment?_____

_____

_____

_____

3. What things do you miss the most from the environment when you were my age?_____

_____

_____

4. What DISADVANTAGES were there in the environment when you were my age?

_____

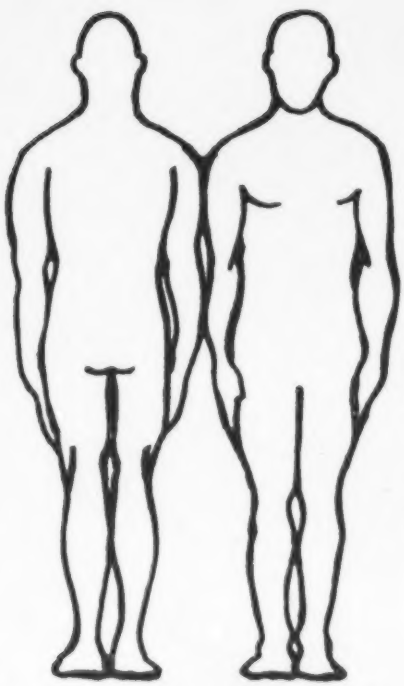
_____

_____

5. Additional comments:_____

_____

_____



# FANTASTIC PHYSIOLOGY

# PHYSIOLOGY

| Age Level | Objectives | Activity Title | Page |
|---|---|---|---|
| 5-8 | The student will be able to: | | |
| | 1. observe and list characteristics of human growth and describe his/her own life cycle. | MARY, MARY QUITE CONTRARY | 165 |
| | 2. describe what he/she hears and how he/she hears. | I FOUND THE SOUND | 166 |
| | 3. describe things he/she sees and how he/she sees. | SAM AND SALLY SHAPE | 168 |
| | 4. describe things he/she tastes and how he/she tastes. | Mm-Mm-Mm GOOD | 170 |
| | 5. describe things he/she feels (touches) and how he/she feels (touches). | FEEL THE SEAL | 172 |
| | 6. describe things he/she smells and how he/she smells. | HOW WELL DO YOU SMELL? | 173 |
| | 7. list the five senses and the function of each. | MATCH-THE-SENSE | 175 |
| | 8. discriminate physical differences and similarities. | SAME OR DIFFERENT | 176 |
| | 9. name and locate the external parts of the body. | WHERE DOES IT HURT?<br>SPIN-A-BODY-PART<br>THE BODY BOX | 177<br>178<br>100 |
| | 10. identify the general locations of the following internal organs: heart, stomach, lungs, kidneys, brain and spinal cord. | WHERE DOES IT HURT? | 177 |
| 8-10 | 11. describe and explain the functions of the following parts of the skeletal system: bones, vertebrae, pelvis, femur, tibia, rib cage, spinal cord. | SKELETAL MOBILE | 181 |
| | 12. explain the inter-relationship between the brain and the skeletal system (voluntary and involuntary movement). | TO THINK OR NOT TO THINK | 183 |
| | 13. list functions of the skin. | SKIN IS IN | 184 |
| | 14. describe the function and major organs of the circulatory system: the heart and its parts, veins, arteries and capillaries. | THE LONG WAY AROUND<br>PART OF A HEART | 185<br>186 |
| | 15. describe the function and major organs of the respiratory system: nose, mouth, windpipe, lungs, throat, and diaphragm. | RESPIRATORY RUMMY | 187 |
| | 16. describe and explain the functions of the following parts of the digestive system: mouth, teeth, salivary glands, esophagus, stomach, small and large intestines. | DIGESTION DILEMMA | 188 |
| | 17. define the term, system, and explain it with examples. | WORKING TOGETHER | 190 |
| | 18. relate the organ or body part to a system. | A SYSTEM-ATIC PATH | 191 |

| Age Level | Objectives | Activity Title | Page |
|---|---|---|---|
| 8-10 cont. | 19. define and explain the functions of the body systems and the organs within the systems. | BEAT THE SYSTEMS CLOCK | 193 |
| | 20. describe the parts and functions and major organs of the nervous system: brain, nerves, spinal cord. | NERVOUS CHARADES | 194 |
| 10-12 | 21. diagram the structure of a typical cell. | HOW WELL CAN YOU TELL A CELL? | 195 |
| | 22. explain the characteristics and functions of the basic types of human tissues. | TISSUE TEAMS | 197 |
| | 23. state the interrelationships between protoplasm, cells, tissues, organs and systems. | WATCH YOUR STEP! | 199 |
| | 24. expand the structure and function of the circulatory system to include lungs, liver, and parts of the blood. | BLOOD BANK | 201 |
| | 25. expand the structure and function of the respiratory system to include use of oxygen in the cells. | RESPIRATION RACE | 203 |
| | 26. expand the structure and function of the digestive system to include liver, gall bladder, and pancreas. | DIGESTIVE DUMMY | 204 |
| | 27. expand the structure and function of the skeletal system to include muscles, joints, tendons, and ligaments. | THE SKELETAL MAID | 206 |
| | 28. describe the major organs and function of the excretory system: colon, kidneys, urinary bladder, skin and lungs. | WASTEFUL THINKING | 208 |
| | 29. describe the major glands and functions of the endocrine system: pituitary gland, thyroid gland, parathyroid glands, thymus, adrenal glands and pancreas. | WHAT'S THE MESSAGE? | 209 |
| | 30. expand the structure and function of the nervous system to the parts of the brain. | GIVE ME A PIECE OF YOUR MIND | 210 |
| | 31. diagram and label the parts of the ear. | EAR HUNT | 212 |
| | 32. diagram and label the parts of the eye. | "EYE" SPY | 214 |
| | 33. describe the parts of the nose and their functions. | WHO KNOWS THEIR NOSE? | 218 |
| | 34. describe "taste" functions of the areas of the tongue. | TASTEFUL TONGUES | 220 |
| | 35. classify an organ according to its system. | BODY TEAMS<br>BODY BINGO | 222<br>223 |

# MARY, MARY QUITE CONTRARY

Physiology/Measuring
Communicating
Individual/5-8

Objective: The student will be able to observe and list characteristics of human growth and describe his/her own life cycle.

Materials:

1. Body Measuring Sheet (see illustration).

Procedures:

1. Teach students, as a group, the following poem:

   Mary, Mary, quite contrary,
   How does your body grow?
   It grows taller,
   Does not get smaller,
   And grows wider, didn't you know?

2. Discuss ways in which the children grow. Include height, weight, hair length, foot length, hand width, width and length of various parts of the body.

3. Compare the size of a 5-8 year old with an 8-10 year old, then a 10-12 year old, and finally an adult.

4. Have children fill out a Body Measuring Sheet the first day of each month for the entire school year. Compare the new sheet each month with sheets from previous months.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Trace outline of the bodies of the different ages listed in step 3 of the procedures. Use them for display in the room and discussion on growth.

2. Trace an outline of the body of a child in the class each month. Compare and use for discussion.

Interest Span: One school year (off and on)

Related Subject Areas: Math

Practical Hints:

1. Make sure children have adequate and accurate measuring skills.

Body Measuring Sheet

I am _____ cm tall.

My hand is _____ cm wide.

I weigh _____ kg.

My foot is _____ cm long.

My hair is _____ cm long.

My leg is _____ cm around.

Name _____

Date _____

# I FOUND THE SOUND

Objective: The student will be able to describe what he/she hears and how he/she hears.

Materials:

1. McDonalds's quarter pounder boxes numbered and half-filled with the items listed below and taped or stapled shut:

| | |
|---|---|
| 1. unpopped popcorn | 6. cotton balls |
| 2. buttons | 7. small pencils |
| 3. screws | 8. bird seed |
| 4. sand | 9. dry cereal |
| 5. bottle caps | 10. macaroni |

2. Sound Picture - Answer Card (see next page)

3. Sound Record Card (see next page)

Procedures:

1. Student shakes the container and listens to the sound. Then he/she looks at the picture card and tries to decide what he/she "hears" inside.

2. Next, the student finds the number of the container on his/her record card and in the "What I Think It Is" section he/she draws a picture. (can copy picture from card)

3. Then the student checks answer key to see what is actually in the container. Then he/she draws a picture in "The What It Is Section?"

4. Repeat procedure for the nine remaining containers.

Indication of Mastery: Look at record card to see if child has correctly identified 8 of the 10 sounds.

Variations and Extensions

1. Set up as Stations.

Interest Span: 30-40 minutes

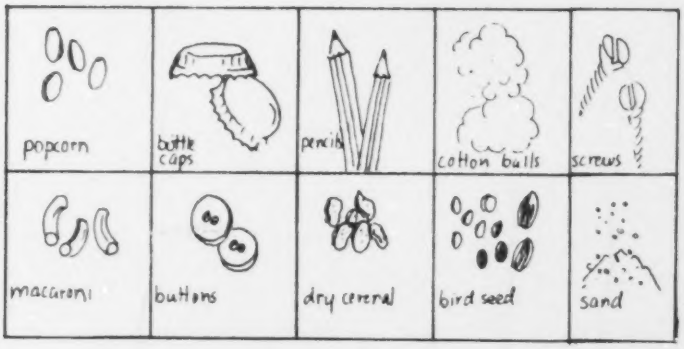
Related Subject Areas: Math, Reading, Fine Arts

Practical Hints:

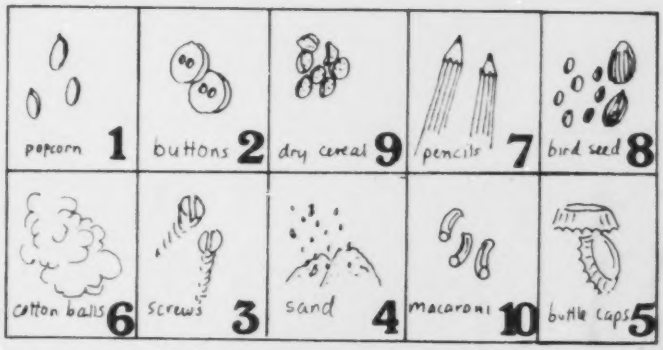
1. Laminate picture answer card

## SOUND PICTURE/ANSWER CARD

### Side A: Pictures




### Side B: Answer Key




| number | what I think it is | what it is |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

**SAMPLE STUDENT RECORD CARD**

# SAM & SALLY SHAPE

Objective: The student will be able to describe things he/she sees and how he/she sees things.

Materials:

1. Shapes cut out of felt and arranged on flannel boards. See illustration.
2. Tape recorder.

Procedures:

1. Set up flannel board as directed in materials section.
2. Have individual students go to the flannel board, turn on the tape recorder and describe what he/she sees.
3. Allow each student a turn.

Indication of Mastery: Successful description of flannel board arrangement.

Variations and Extensions:

1. Make other flannel board objects for children to describe.

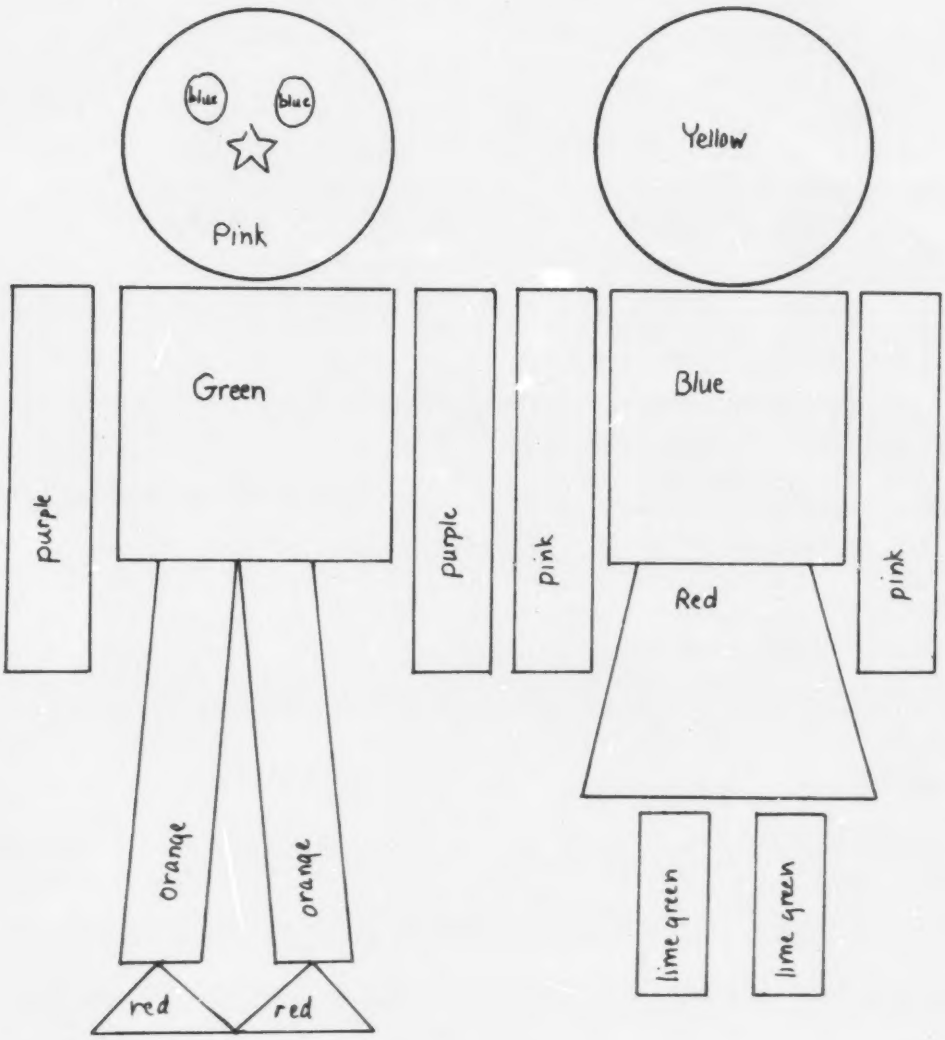
Interest Span: 10 minutes per student.

Related Subject Areas: Math and Language

Practical Hints:

1. Do activity in a fairly isolated part of room.
2. Make sure children can operate recorder.

## SAM & SALLY SHAPE
## SAMPLE FLANNEL BOARD ARRANGEMENT



# Mm-Mm-Mm GOOD

Physiology/Observation
Communicating
5-8/Individual

Objective: The student will be able to describe things he/she tastes and how he/she tastes.

Materials:

1. Small serve-a-portion cups (nut cups) containing the following items:

   a. salt
   b. salted peanuts
   c. salted sunflower seeds
   d. sugar
   e. orange sections
   f. candy
   g. unsweetened chocolate
   h. lemon
   i. grapefruit
   j. dill pickles
   k. cinnamom
   l. vanilla

2. Mm-Mm-Mm Good Record Card

Procedures:

1. Child tastes food, finds it on record card and checks the section which describes the taste. For instance, the lemon has a sour taste so the student checks sour by the lemon.

Indication of Mastery: Completion of Record Card with 80% accuracy.

Variations and Extensions:

1. Set this activity up as stations.

Interest Span: 30-40 minutes (As long as there is food!)

Related Subject Area: Math and Reading

Practical Hints:

1. Make sure students can identify taste words.
2. Provide popsicle sticks or spoons so children do not have to handle food.
3. Make portions in each cup small.

## MM-MM-GOOD RECORD CARD

| FOOD | SWEET | SOUR | SALTY | BITTER |
|---|---|---|---|---|
| salt | | | | |
| cinnamon | | | | |
| lemon | | | | |
| candy | | | | |
| salted peanuts | | | | |
| grapefruit | | | | |
| sugar cube | | | | |
| unsweetened chocolate | | | | |
| orange sections | | | | |
| salted sunflower seeds | | | | |
| vanilla | | | | |
| dill pickle | | | | |

Physiology/Observation
Individual/5-8

# FEEL THE SEAL

Objective: The student will be able to describe things he/she feels (touches) and how he/she feels (touches).

Materials:

1. Enlarged picture of seal (see illustration). The seal should be large enough to cover a bulletin board or to make an attractive wall display.
2. Various pieces of material that have different textures. Include things that are rough, smooth, scratchy, fluffy, hard, soft, and other textures. Cover the seal with these pieces of material (see diagram).
3. Blindfold for a child.

Procedures:

1. Guide a blindfolded child to the seal. Have him/her select a spot on the seal to touch. Then have him/her describe what is felt.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. After the surface is described, have him/her decide what material it is.
2. Use for a testing situation.

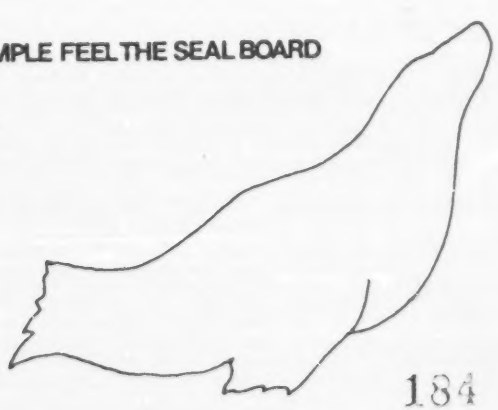
Interest Span: 10-15 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Cut the seal out of heavy paper or tagboard and mount on a bulletin board so pieces of material can be tacked or stapled on.
2. Make areas large enough so student can really "feel" the texture.

SAMPLE FEEL THE SEAL BOARD



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Physiology/Interpreting Data
Communication, Observation
5-8/Small groups or Individual

# HOW WELL DO YOU SMELL?

Objective: The student will be able to describe things he/she smells and how he/she smells.

Materials:

1. 10 small pill bottles and 10 pieces of cotton soaked with the following liquids or solids: (Label bottle with proper letters.)

   a. pine room freshener
   b. perfume
   c. strawberry foam freshener
   d. grated lemon rind
   e. moth balls
   f. grated onion
   g. grated orange rind
   h. garlic powder
   i. ground coffee
   j. rubbing alcohol

2. How Well Do You Smell Record Card. Letters correspond to letters on bottles. (see next page)

3. Gummed stars or stickers

Procedures

1. Student smells bottle. If he/she can verbally identify the smell, the teacher puts a star on the "Know" section of card. If he/she cannot, the teacher puts a star on the "Don't Know" section.

2. Child communicates to teacher or another student what he/she can and cannot identify by looking at Record Card.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Set up each bottle as a small learning station for 2 or 3 children. Children mark their record cards as they follow the stations alphabetically. Their card will then indicate if they followed directions and if they missed a station.

Interest Span: 20-30 minutes

Related Subject Areas: Language Arts, Reading, and Math

Practical Hints:

1. Make sure cotton balls are saturated so smell lasts.
2. Put holes in cover of bottles so caps are not constantly removed or lost.

# HOW WELL DO YOU SMELL RECORD CARD

| WHAT IT IS? | KNOW | DON'T KNOW |
|---|---|---|
| a. | | |
| b. | | |
| c. | | |
| d. | | |
| e. | | |
| f. | | |
| g. | | |
| h. | | |
| i. | | |
| j. | | |

# MATCH THE SENSE

Objective: The student will be able to list the five senses and the function of each.

Materials:

1. Sense String Chart (see illustration). The dots are places for brass fasteners. Attached to the brass fasteners on the left-hand side are 10 centimeter strings.

Procedures:

1. Child matches a sense organ with function by connecting string from picture on left-hand side to corresponding function on right-hand side.

Indication of Mastery: Connection of strings with 100% accuracy.

Variations and Extensions: Have students give examples of where they used each sense.

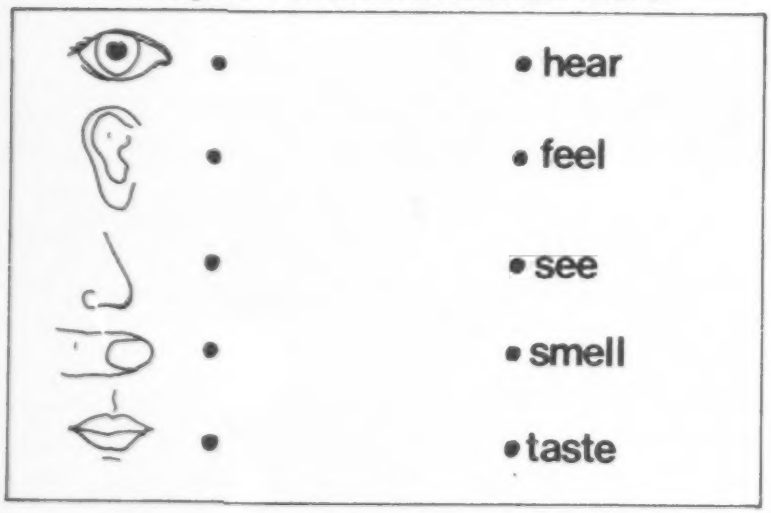
Interest Span: 10 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate for durability.
2. Make activity self-correcting by providing an answer key on reverse side.

## Sample Match the Sense Card



# SAME OR DIFFERENT

Objective: The student will be able to discriminate physical differences and similarities.

Materials:

1. Folder with two pockets. One pocket is labeled "same", one pocket is labeled "different."

2. Thirty (30) same and different picture cards--a same and different card is a 3x5" card on which two people are drawn. Either they are exactly the same or differ in one or more physical characteristics. Differences in characteristics could include:

| | | |
|---|---|---|
| height | eye color | skin color |
| weight | hair color | foot size |
| arm length | hair style | leg length |

Procedures:

1. Child classifies each card as being the same or different by placing the card in the appropriate pocket of folder.

Indication of Mastery: Classification of cards with 80% accuracy.

Variations and Extensions: Use diagram other than people.

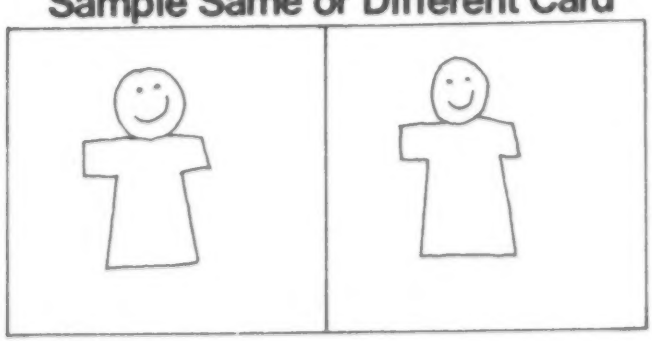
Interest Span: 10-15 minutes

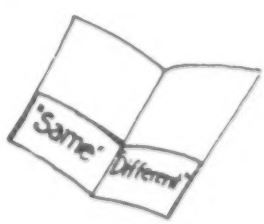
Related Subject Areas: Reading

Practical Hints:

1. Laminate folder and cards for longer wear.

**Sample Same or Different Card**





# WHERE DOES IT HURT?

Objectives: The student will be able to name and locate the external parts of the body.

The student will be able to identify the general locations of the following internal organs: heart, stomach, lungs, kidneys, brain, spinal cord.

Materials:

1. 20 cards with a doctor drawn on one side and one of the following ailments written on the other:

| | | |
|---|---|---|
| heartburn | skinned knee | kidney infection |
| headache | cut finger | appendicitis |
| upset stomach | bruised hand | stiff neck |
| fever | chapped lips | short breath |
| toothache (loose tooth) | chest cold | ingrown toenail |
| earache | backache | bruised thigh |
| bloody nose | dislocated elbow | |

Procedures:

1. Small group of children and an adult sit together.
2. Each child gets a turn at drawing a card. The adult reads the ailment. If the child can identify where it would hurt, he/she can keep the card.
3. Play continues until the cards are gone. The child with the most cards wins.

Indication of Mastery: Identification of location on body with 100% accuracy.

Variations and Extensions: Have students draw body part card and describe an ailment it could have.

Interest Span: 30-40 minutes

Related Subject Areas: Language Arts (non-verbal expression)

Practical Hints:

1. Laminate cards for longer wear.

# SPIN-A-BODY-PART

Objective: The student will be able to name and locate the external parts of the body.

Materials:

1. Body Spinner--10 inch pizza plate divided into 16 sections (see illustration). In each section there should be a picture of one of the following body parts:

| | | | |
|---|---|---|---|
| eye | hair | arms | foot |
| ear | mouth | hand | thumb |
| nose | teeth | finger | elbow |
| head | neck | leg | knee |

   A spinning device is attached in the center.

Procedures:

1. Small group of children take turns spinning the spinner. As a child spins a body part, he/she has to name that part and locate it on his/her body.

Indication of Mastery: Child names and locates body parts with 80% accuracy.

Variations and Extensions:

1. Child draws a picture after spinning a part. Continues drawing until a whole person is drawn. Or, child has a laminated picture of a body and crosses off the part as he/she spins it.

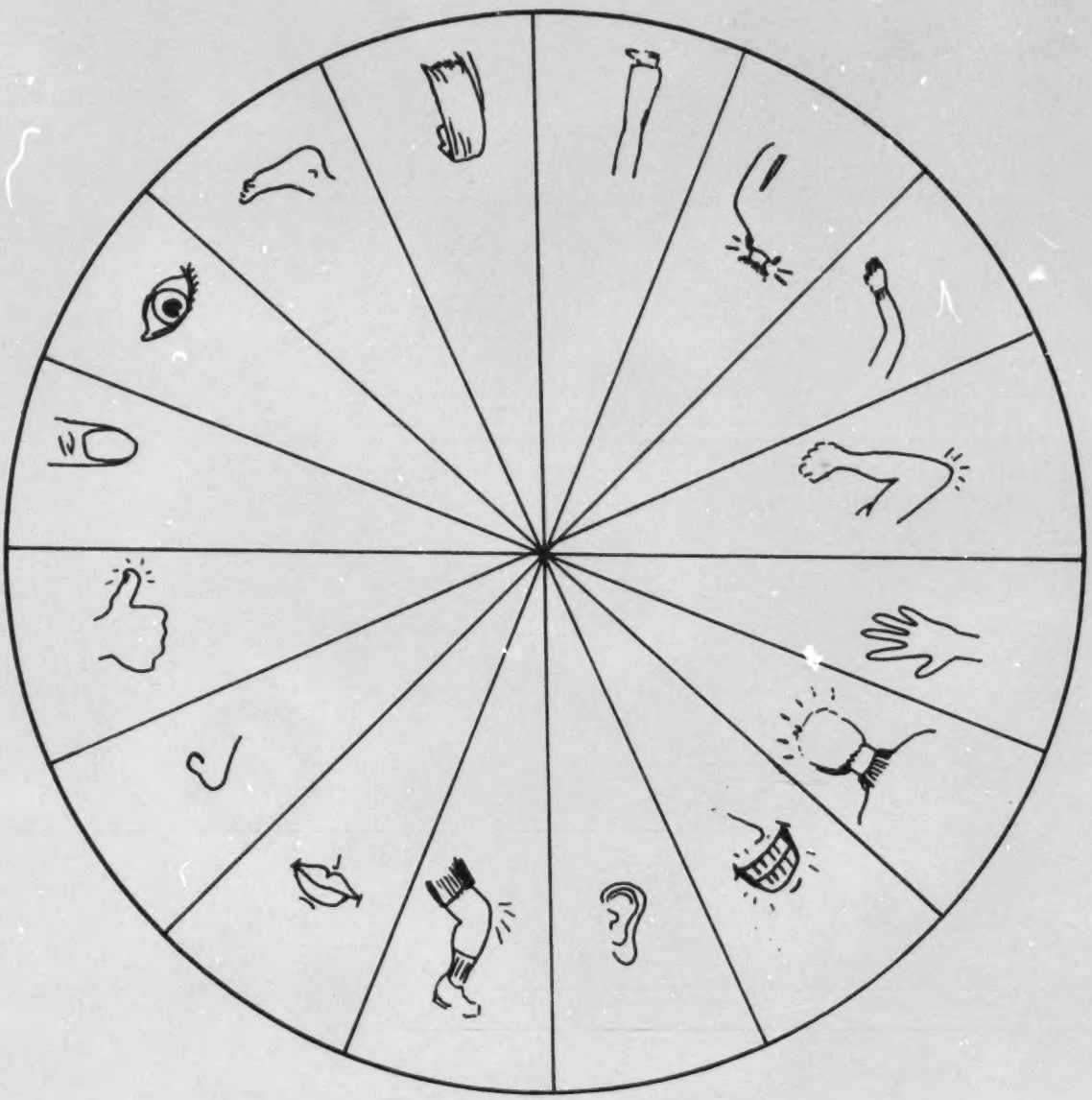
Interest Span: 30-40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate spinner for longer wear.

## SAMPLE SPINNER



# THE BODY BOX

Objective: The student will be able to name and locate the external parts of the body.

Materials:

1. Body Box--large shoe box decorated with magazine pictures of people. It should be open at the top or have a hole large enough for a child's hand. See illustration.

2. Laminated pictures of the following body parts on cards:

| | | | |
|---|---|---|---|
| eye | hair | arms | foot |
| ear | mouth | hand | thumb |
| nose | teeth | finger | elbow |
| head | neck | leg | knee |

Procedures:

1. Small group of children sit around Body Box.

2. One child draws a card. If he/she can name the part and locate it on his/her body, he/she can keep the card. The child puts the card back if he/she cannot perform the task.

3. Each child gets a turn. Play continues until all cards are gone. Player with most cards wins.

Indication of Mastery: Quiz each child with the body part cards--80% accuracy.

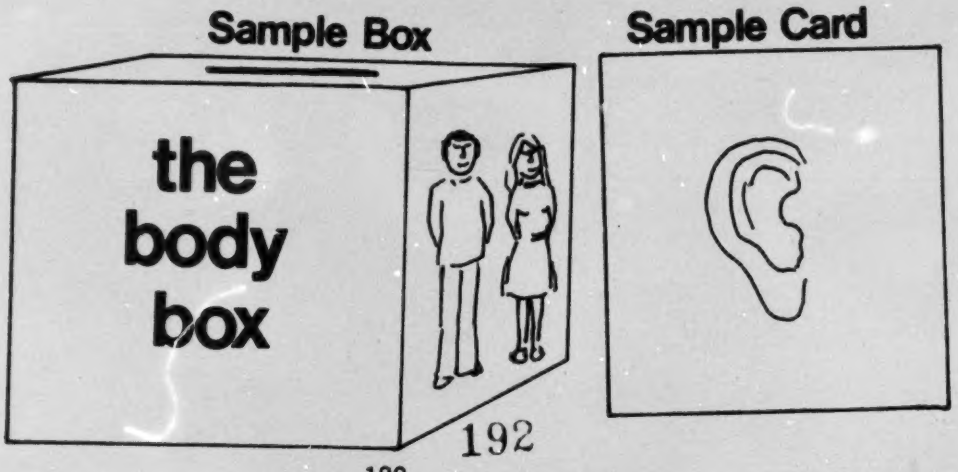
Variations and Extensions: Match the cards to a diagram of a human.

Interest Span: 30-40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Cover Body Box with clear contact paper for greater durability.



# SKELETAL MOBILE

Objective: The student will be able to describe and explain the function of the following parts of the skeletal system: bones, vertebrates, pelvis, femur, tibia, and spinal cord and rib cage.

Materials:

1. Pattern pieces of all parts of the skeletal system. (see next page)
2. Manila or white tagboard for each student participating.
3. Paper Punch
4. Brass Fasteners
5. Transparency of skeleton (see next page)

Procedures:

1. Have children cut out all pieces of skeleton using patterns.
2. As a group, label each piece.
3. Project transparency and have children put their skeleton together while looking at transparency. They can punch holes on connecting pieces and attach them with brass fasteners.
4. Punch hole in top of skull, attach string and hang.

Indication of Mastery: A completed Skeleton

Variations and Extensions:

1. Have students take skeleton apart and put it back together without the transparency.
2. Use in a testing situation. Have children label parts, cut out, and put together without any help.

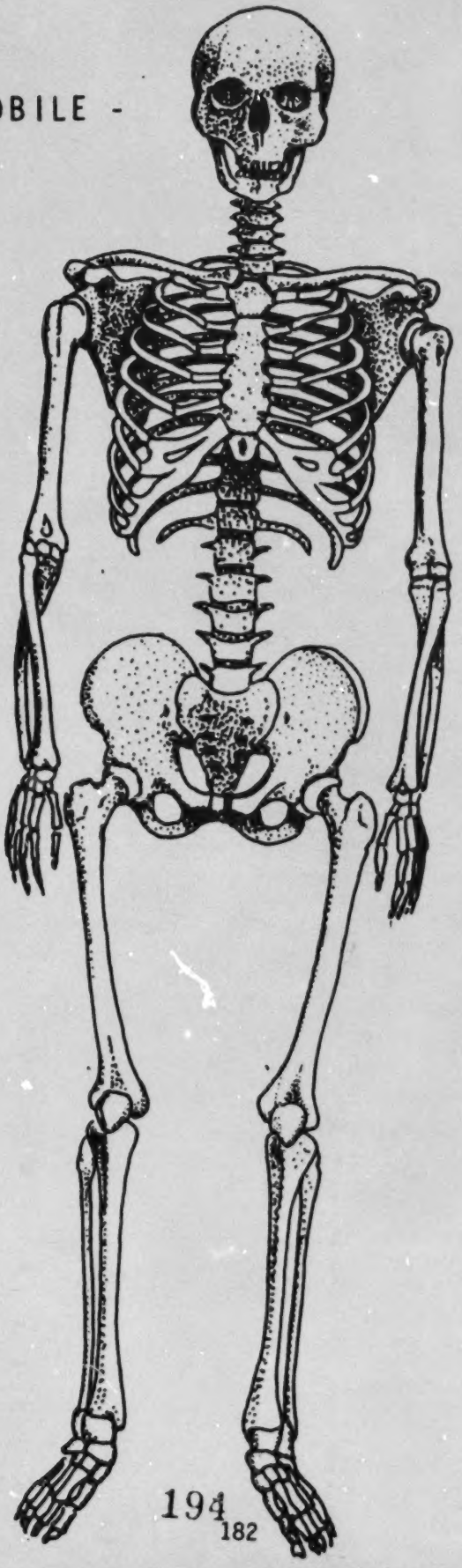
Interest Span: 40-50 minutes

Related Subject Areas: Language Arts

Practical Hints: Have students name the parts as they put them together.

SKELETAL MOBILE -

CONT.



# TO THINK OR NOT TO THINK

Objectives: The student will be able to explain the inter-relationship between the brain and the skeletal system and voluntary and involuntary movement.

Materials:

1. List of voluntary and involuntary movements of the body (see below).
2. One thinking person and one non-thinking person for each student (see illustration - each picture is attached to a popsicle stick or tongue depressor.)

Procedures:

1. Teacher reads a type of body movement from the list. If it is a voluntary movement or one a person has to think about, the students raise the picture of the "thinking" person. If it is an involuntary movement or one that happens without a person thinking about it, the student raises the "non-thinking" person.

Indication of Mastery: Participation in activity with 80% accuracy.

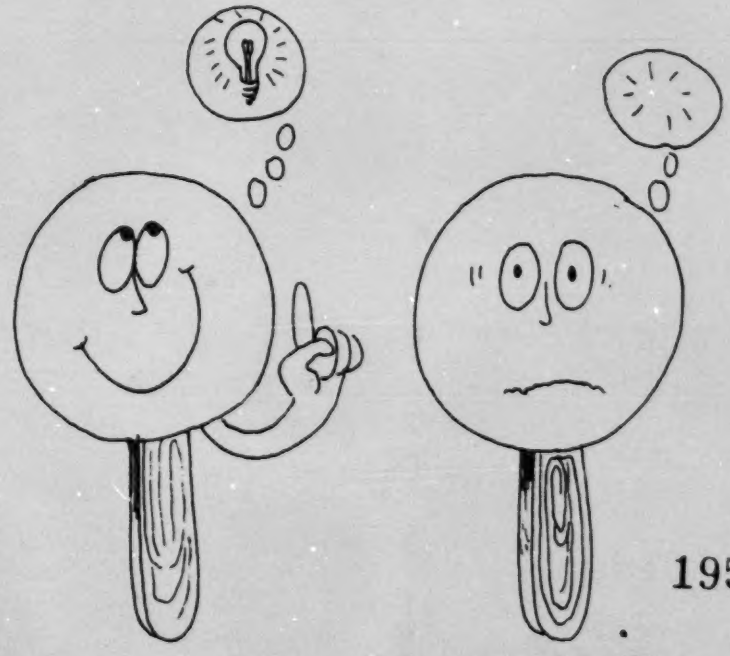
Variations and Extensions: Have students "sort" the body movements into voluntary and involuntary piles.

Interest Span: 30 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate thinkers and non-thinkers for durability.



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List of Body Movements

Voluntary

kicking
running
wiggling nose
bending back
eating
tapping finger on desk

Involuntary

moving after touching something hot
twitch of an eyelid
beat of heart
stomach gurgling
food moving out of stomach
blood moving through veins
hiccuping
gassing

# SKIN IS IN

Objective: The student will be able to list the functions of the skin.

Materials:

1. Outline of person sheet (See "Skin Is In" Diagram)
2. Characteristic Sheet ( See below)

Procedures

1. Child cuts apart characteristics (see sample list) and pastes those which are characteristics or functions of skin inside the outline of the person.

Indication of Mastery: Completion of sheet with 80% accuracy.

Variations and Extensions:

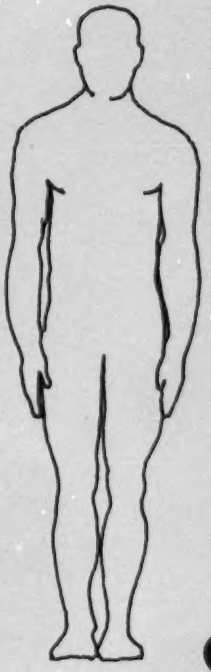
1. Draw outline on tagboard. Type characteristics on tagboard strips. Laminate all pieces and use as a learning station.

Interest Span: 20 minutes

Related Subject Areas: Reading

Practical Hints:

1. Make sure students have been previously introduced to the functions of the skin.



Sample Characteristic List

Skin

- protects body from germs
- protects body from pain
- keeps body temperature even
- gives off wastes (sweat)
- reacts to sensation of touch

Skeleton

- keeps body rigid
- place to attach muscles
- protects internal organs
- allows body parts to move

# THE LONG WAY AROUND

Objective: The student will be able to describe the function and major organs of the circulatory system: the heart and its parts, veins, arteries, and capillaries.

Materials:

1. Two desks.
2. Two students.
3. Barrier to put between two desks, such as a bookcase, blackboard, or bulletin board.
4. Diagram of circulatory system that shows the chambers of the heart.

Procedures:

1. Set up two desks with a barrier between them. Have students sit in the two desks.
2. Present this question to the class: How can the person from the left side get to the right side? He/she cannot go through the barrier. He/she has to go all the way around. (Have student do this). Reverse demonstration from right to left.
3. Show diagram of the heart and circulatory system. Present the concept that the blood cannot go from the left to right or right to left of the heart. It has to circulate all around the body and lungs, just as the two people had to walk around the barrier.

Indication of Mastery: Participation in activity.

Interest Span: 10 minutes

Variations and Extensions: Have entire class break into pairs and do demonstration.

Related Subject Areas: Language Arts

Practical Hints:

1. Repeat demonstration until concept is understood.

# PART OF A HEART

Objective: The student will be able to describe the function and major organs of the circulatory system: the heart and its parts, veins, arteries and capillaries.

Materials:

1. Six transparencies of the human heart, each with one of each of the following parts missing:

    1. right auricle
    2. right ventricle
    3. left auricle
    4. left ventricle
    5. an artery
    6. a vein

2. Dittoed copies of all six transparencies stapled in a booklet for each child participating.

3. One transparency of the heart without anything missing.

Procedures:

1. Project accurate transparency of heart and review its structure.

2. Present transparency with a missing part and have children draw in and label part that's missing on their dittoed copies.

3. Draw missing part in on the transparency and have children correct their papers.

4. Repeat with all six transparencies.

Indication of Mastery: Completion of six sheets with 100% accuracy.

Interest Span: 30-40 minutes.

Variations and Extensions:

1. Do not use transparencies and let children draw in parts independently.

Practical Hints:

1. Make sure pictures are clear and the missing part is clearly defined.

# RESPIRATORY RUMMY

Objective: The student will be able to describe the function and major organs of the respiratory system: nose, mouth, throat, windpipe (trachea), lung and diaphragm.

Materials:

1. Sixteen Respiratory Rummy Cards as follows:

| | |
|---|---|
| nose | cleans dust out of air |
| mouth | place where air first enters body |
| throat | air passes through to windpipe or trachea |
| trachea | air passes through to lungs |
| lungs | air sacs which fill when taking air in |
| diaphragm | sheet of muscle which separates chest cavity from abdominal cavity |
| inhale | process of taking in air |
| exhale | process of letting out air |

Procedures:

1. Three players deal out entire deck of cards.
2. Players look at cards and take out any pairs.
3. Players draw from each other, forming pairs when they can.
4. First person to run out of cards wins.

Indication of Mastery: Matching cards with 100% accuracy.

Variations and Extensions:

1. Use Rummy Cards to play Concentration.
2. Have children match the cards individually and put in order of the path air takes from nose to lungs.

Interest Span: 20 minutes

Practical Hints:

1. Laminate cards for durability.

Physiology/Classification
8-10/Small group

# DIGESTION DILEMMA

Objective: The student will be able to describe and explain the functions of the following parts of the digestive system: mouth, teeth, salivary glands, esophagus, stomach, small and large intestines.

Materials:

1. Digestion Dilemma game board (outline of a person with digestive tract drawn in.) The organs are not labeled. See illustration.
2. Digestive Dilemma card deck (28, 3 by 5" cards) which contain 4 individual pictures of each organ.
3. Four playing markers. (e.g. small pieces of plastic fruit.)

Procedures:

1. Four players select a playing piece and place it at the head of the game board.
2. First player draws a card. If it is a mouth card he or she can move. If not, the turn is lost and card is put in a discard pile. If the player draws a mouth card, he/she can draw again. On the second turn a "teeth" card must be drawn before the player can move. A third turn is not allowed. The next player now gets a chance.
3. Players move along the digestive tract in the actual order food would. A player cannot skip a step in the digestive tract.
4. The first player to go through the tract wins.
5. Discard pile is turned over if card deck runs out.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Have student explain what happens to food at each organ as he/she has a chance to move along the board.

Interest Span: 30-40 minutes

Related Subject Areas: Language Arts

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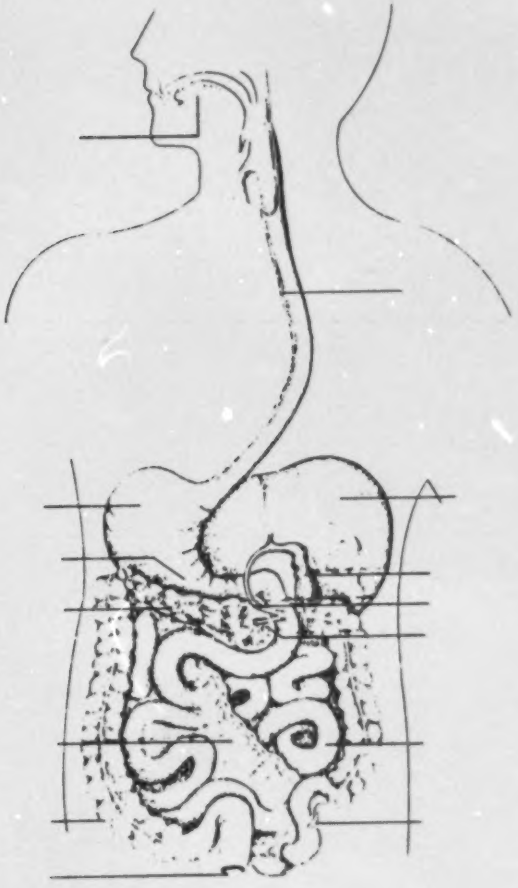
DIGESTION DILEMMA - cont.

Practical Hints:

1. Laminate game board and cards for longer wear.
2. Provide a storage box for board, cards, and markers.

DIGESTIVE DILEMMA GAMEBOARD



Physiology/Classification
Modeling
8-10/Small group

# WORKING TOGETHER

Objective: The student will be able to define the term system and explain it with examples.

Materials:

1. Ten ball-point pens for each small group. The pens should be exactly alike.

Procedures:

1. Have the children take apart each pen and put all similiar parts in one pile.
2. Instruct the children to find the most "organized" or "systematic" way of putting the pens back together, making sure all the children in their small group participate.
3. Have children tell how they organized themselves and what type of system they used to get the pens back together.
4. Discuss everyday things where people work together in teams to form a systematic way of doing things. Some ideas that could be used are: sports, cooking, and stapling papers.
5. Compare experiment and discussion with body functions. Certain parts of our body work together to perform certain functions. For example, eating food. What parts of our body work together to use our food?

Indication of Mastery: Participation in activity

Variations and Extensions

1. Find other tasks that can be completed more efficiently by a group of children working together than by an individual.

Interest Span: 20 to 30 minutes

Related Subject Areas: Social Studies

Practical Hints: Have students write down their ways of putting pens back together.

# A SYSTEM-ATIC PATH

Objective: The student will be able to define and explain the functions of body systems.

Materials:

1. System-atic Path Game Board (see illustration).
2. One of each of the following 3 x 2 inch word cards for each player:
    1. circulatory system
    2. digestive system
    3. skeletal system
    4. respiratory system
    5. nervous system
3. Four playing markers.
4. A die.

Procedures:

1. Players put markers at start.
2. Shake die; person with highest number is first player and others play in clockwise order from first player.
3. Player shakes the die and moves that many spaces. He or she reads the organ name on that space and puts down the card that states the system to which that organ belongs.
4. Play continues until one person has laid down all of his/her cards. If a person has already laid down a card for that system, he/she cannot lay down another card.
5. If a player reaches the end before his/her cards are gone, he/she must go back to the beginning and start over.

Indication of Mastery: Participation in activity.

Variations and Extensions: Name the system for each organ from "start" to "finish".

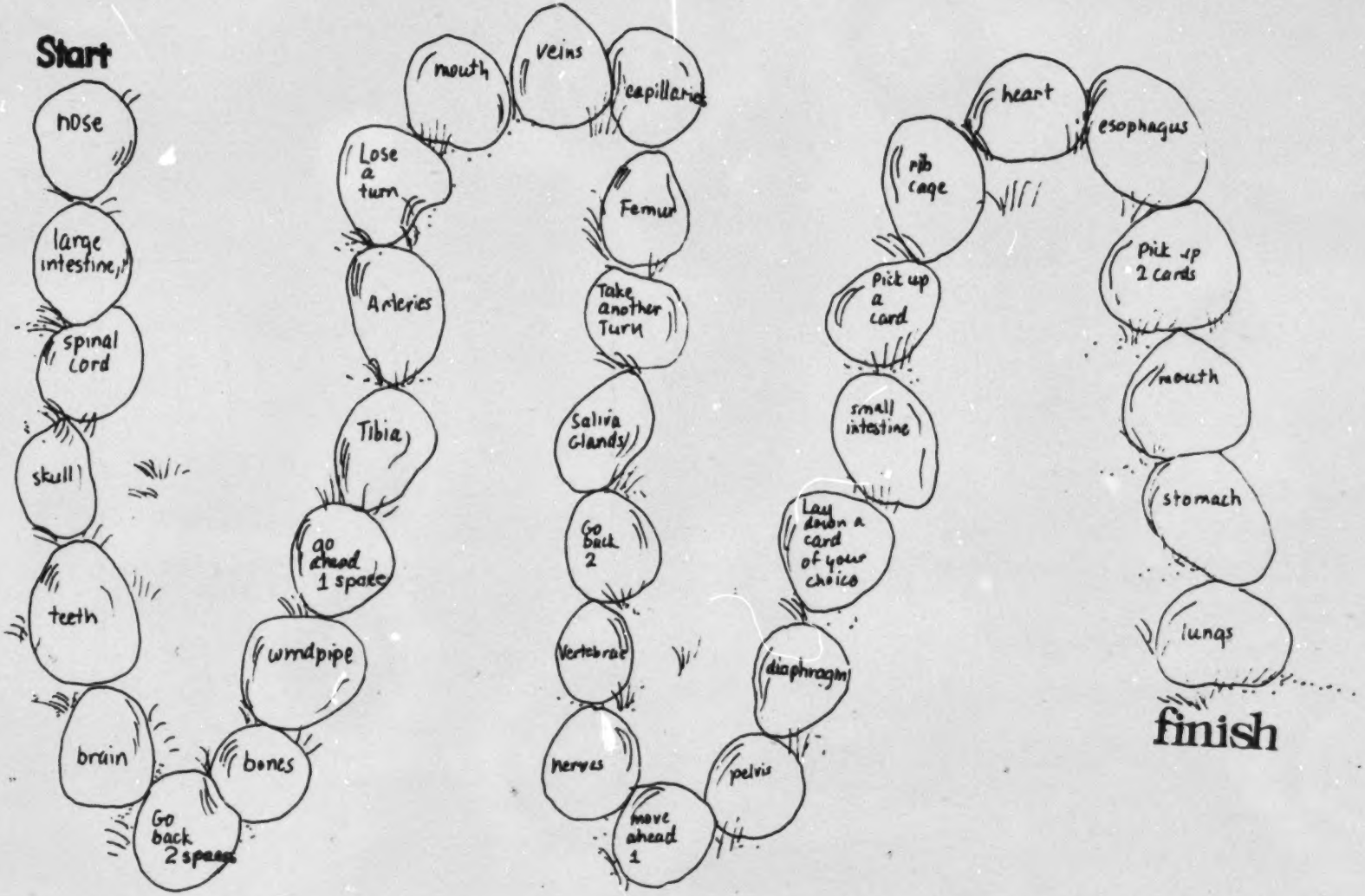
Interest Span: 30-40 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate board and cards for durability.

# SYSTEM-ATIC PATH GAME BOARD



# BEAT THE SYSTEMS CLOCK

Objective: The student will be able to define and explain the functions of the body systems and organs within those systems: respiratory, circulatory, nervous, skeletal, and digestive.

Materials:

1. Egg timer.
2. List of terms and definitions (see illustration).

Procedures:

1. Teacher or leader sets timer at one minute. Then he/she selects one child to give a definition of a word from the list. Child has to state definition of term before timer rings. He or she receives one point if answer is correct.
2. Child with most points at end of list is the winner.

Indication of Mastery: Participation in activity with 80% accuracy.

Variations and Extensions:

1. Play a second round and decrease the time limit.
2. Allow children that are having problems remembering the definitions be the leader.

Interest Span: 50 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Use this activity only after children have been introduced and are very familiar with the terms.

Term and Definitions List

Brain - major organ of the central nervous system.
Lungs - air sacs into which the air we breathe goes.
Windpipe - pipe or tube that lets air into the lungs.
Circulatory System - the heart, arteries and veins that work together to move blood through our bodies.
Capillaries - tiny tubes where blood is exchanged and food is given to the cells.
Vein - a tube which carries blood to the heart.
Heart - the most important muscle in the human body; pumps blood.
Artery - a tube that takes blood away from the heart.
Auricles - upper chambers of the heart.
Ventricles - lower chambers of the heart.
Digestive System - organs that grind up food and make it ready for the bloodstream.
Stomach - organ that receives liquid and solid food and digests it into a pulpy mass.
Small Intestine - completes digestion begun in the stomach.
Large Intestine - gets rid of undigested food and waste.
Tibia - our shin bone.
Vertebrae - our backbone is made up of these small bones.
Pelvis - our hip bone.
Femur - our thigh bone.
Spine - our backbone.
Respiratory System - process of taking air into the lungs and taking waste out of the lungs.
Mouth - place where food enters the body.
Teeth - body part used for grinding food.
Saliva Glands - glands that give off chemicals that break down food.
Esophagus - place where food passes after it is swallowed and before it enters the stomach.

# NERVOUS CHARADES

Objective: The student will be able to describe the function and major organs of of the nervous system: brain, spinal cord and nerves.

Materials:

1. The name of each of the following organs printed on a 5x7" card. Attach strings to the cards so they can be placed around a person's neck.

| | (various body parts that move) | |
|---|---|---|
| brain | arm | finger |
| spinal cord | hand | knee |
| nerve (6) | head | elbow |
| eye (1) | leg | foot |

2. Each of the following body movements written on small slips of paper, folded, and placed in a hat. (Various parts and movements are included to provide variety in a large group)

| | | |
|---|---|---|
| turn your head | raise your arm | kick your leg |
| bend your elbow | wiggle your foot | clench your fingers |
| hold up your hand | bend your knee | |

Procedures:

1. Assign a small group of children (10) the name cards.
2. Discuss the nervous system. Indicate how things we see and how we react are communicated to the body.
3. The person that is the "eye" reads silently from a slip out of the hat and walks to and whispers to the next step of the nervous system, who will have on the appropriate name tag, what the slip says. The message is passed silently to all parts of the nervous system in the actual order it would happen in a body until it reaches the person who is designated as the body part (e.g. the head in "turn your head"). This person then puts on the proper name card and performs the action.
4. The eye has to tell if this was the original message. If it was not, discuss the breakdown of communication and how brain damage or spinal cord damage breaks the communication in the nervous system.
5. Repeat until the hat is empty.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use a similar activity to illustrate the communication in the nervous system during a reflex movement.

Interest Span: 40-50 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Use as a review or as an initiating activity if guided by the teacher.

# HOW WELL CAN YOU TELL A CELL

Objective: The student will be able to diagram the structure of a typical cell, and explain the function of each part.

Materials:

1. "Tell A Cell" Playing Board for each of 3 players (see next page)
2. 27, 2" x 1" "Tell A Cell" playing cards - 9 cell membranes, 9 nucleus, 9 protoplasm. (see next page)
3. "Tell A Cell" Answer Key. (see next page)
4. 3 "Dead Cell" Cards (They are 2" x 1" cards with the words "Dead Cell" typed on them.)

Procedures:

1. Each of 3 players takes a playing board. The 30 playing cards are placed face down in center of the group.
2. First player draws a card, places it on proper spot of playing board, and gives two functions. If he/she draws a "dead-cell" card, the turn is lost.
3. Play continues counter-clockwise until one player has his/her board filled up. A filled up board would include the name of each part of the three parts of the cell and two functions of each part.
4. A player cannot use a card twice. Therefore, if a card is drawn that he/she has on his/her card the turn is lost.
5. Cards not used are placed face up in a discard pile and used over again if the original pile is used up.
6. The answer card is used to settle arguments.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Use cards and a board for an individual classification activity.

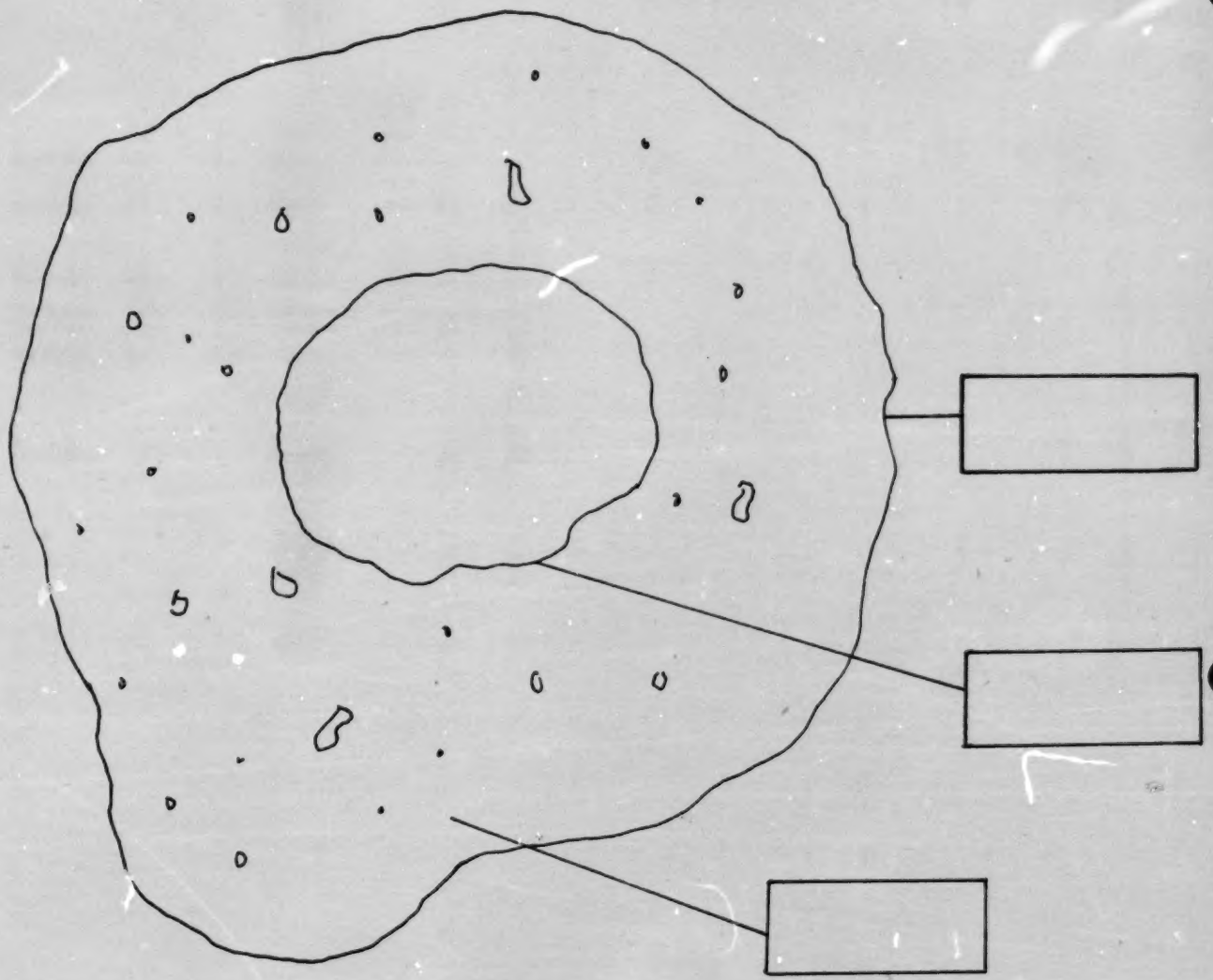
Interest Span: 30-40 minutes

Related Subject Areas: Reading

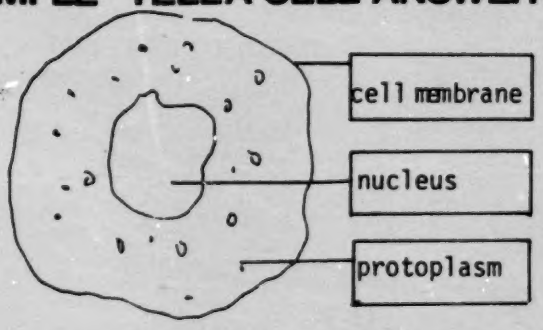
Practical Hints:

1. Laminate cards and playing board for durability.

## SAMPLE "TELL-A-CELL" PLAYING BOARD



## SAMPLE "TELL-A-CELL" ANSWER CARD



Physiology/Classification
10-12/Small group

# TISSUE TEAMS

Objective: The student will be able to explain the characteristics and functions of the basic types of human tissue.

Materials:

1. Five baseballs each naming one of the following types of tissues:

   epithelial tissue
   nerve tissue
   connective tissue
   muscle tissue
   blood tissue

   See next page for sample balls and cards.

2. 25, 2 x 3 inch tissue characteristic cards. There are five characteristics for each type of tissue. (see next page)

3. Answer Key (see next page)

Procedures:

1. Each of 5 students selects one baseball. This becomes their "tissue team".

2. First player draws a characteristic card. If it is a characterisitic of his/her team he/she may keep it. If not, the card is placed face up next to the other cards.

3. Play continues counter clockwise until one person has all the members or characterisitics of his/her team. This person is the winner.

4. If the pile runs out before someone wins, use the discard pile.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Allow one student to use all balls and cards to classify the characteristics individually.

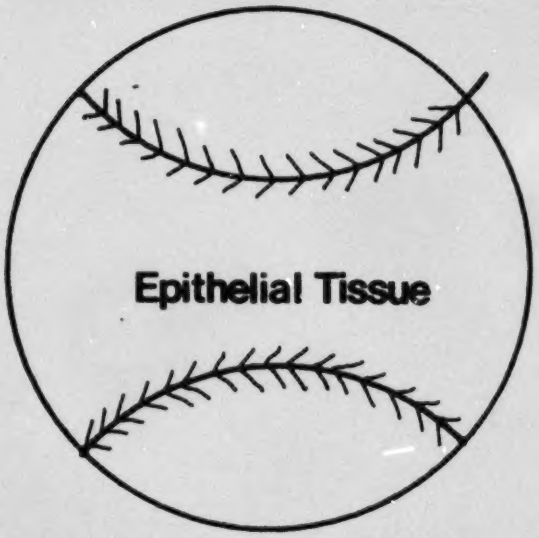
Interest Span: 30-40 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate card and balls for durability.

## SAMPLE BALL AND CARD




flat
thin
cells

| | | |
|---|---|---|
| Blood Tissue - | 1. | liquid tissue |
| | 2. | cells floating in it |
| | 3. | red cells with no nuclei |
| | 4. | white cells |
| | 5. | small irregular platelets |
| Epithelial Tissue - | 1. | flat thin cells |
| | 2. | protect other cells |
| | 3. | line the inside of cheek |
| | 4. | skin made of these cells |
| | 5. | covers organs inside body |
| Nerve Tissue - | 1. | sends messages to brain and body parts |
| | 2. | cells have long branches that connect to other cells |
| | 3. | cells are called neurons |
| | 4. | controls voluntary movement |
| | 5. | controls involuntary movement |
| Connective Tissue - | 1. | tissue that connects bones |
| | 2. | tissue forms ligaments that connect bones |
| | 3. | tissue forms tendons that connect muscles and bones |
| | 4. | formed from cells with fibers |
| | 5. | tough, strong tissue |
| Muscle Tissue - | 1. | long and thin |
| | 2. | more than one nucleus |
| | 3. | cells have no membrane between them |
| | 4. | appear as bands and strips |
| | 5. | used for movement |

Physiology/Classification
10-12/Small group

# WATCH YOUR STEP!

Objective: The student will be able to state the interrelationship between protoplasm, cells, tissues, organs, and systems.

Materials:

1. One "Watch Your Step" Game Board for each player, as shown on the next page. Board should be 12" x 12".

2. 10 "feet" for each player: 5 left feet, and 5 right feet. On each of the left feet, print the following words:

   1. protoplasm
   2. cells
   3. tissue
   4. organs
   5. systems

   On the right feet, print the definitions of each of the above words. The definitions are as follows:

   1. living matter
   2. smallest living unit and made of protoplasm
   3. cells of same size, shape, or other characteristics which work together
   4. tissues working together to perform a job
   5. organs working to perform a job together.

   These feet should be the same size as those drawn on the game board.

3. One die

Procedures:

1. Small groups of 3 or 4 children, each shake the die. The student with the highest number starts first.

2. The first player shakes the die and draws that many feet from his/her pile of 10. He/She then places those feet on the proper spot on the game board. Words must be matched to definitions and definitions to words.

3. Play continues counter clockwise until a player correctly places all 10 feet on the game board. This person is the winner.

4. The answer key is used to make sure the winner has placed the feet correctly. If he/she has not placed the feet correctly, play continues and he/she must take off the incorrect feet and play again.

Indication of Mastery: Participation in activity.

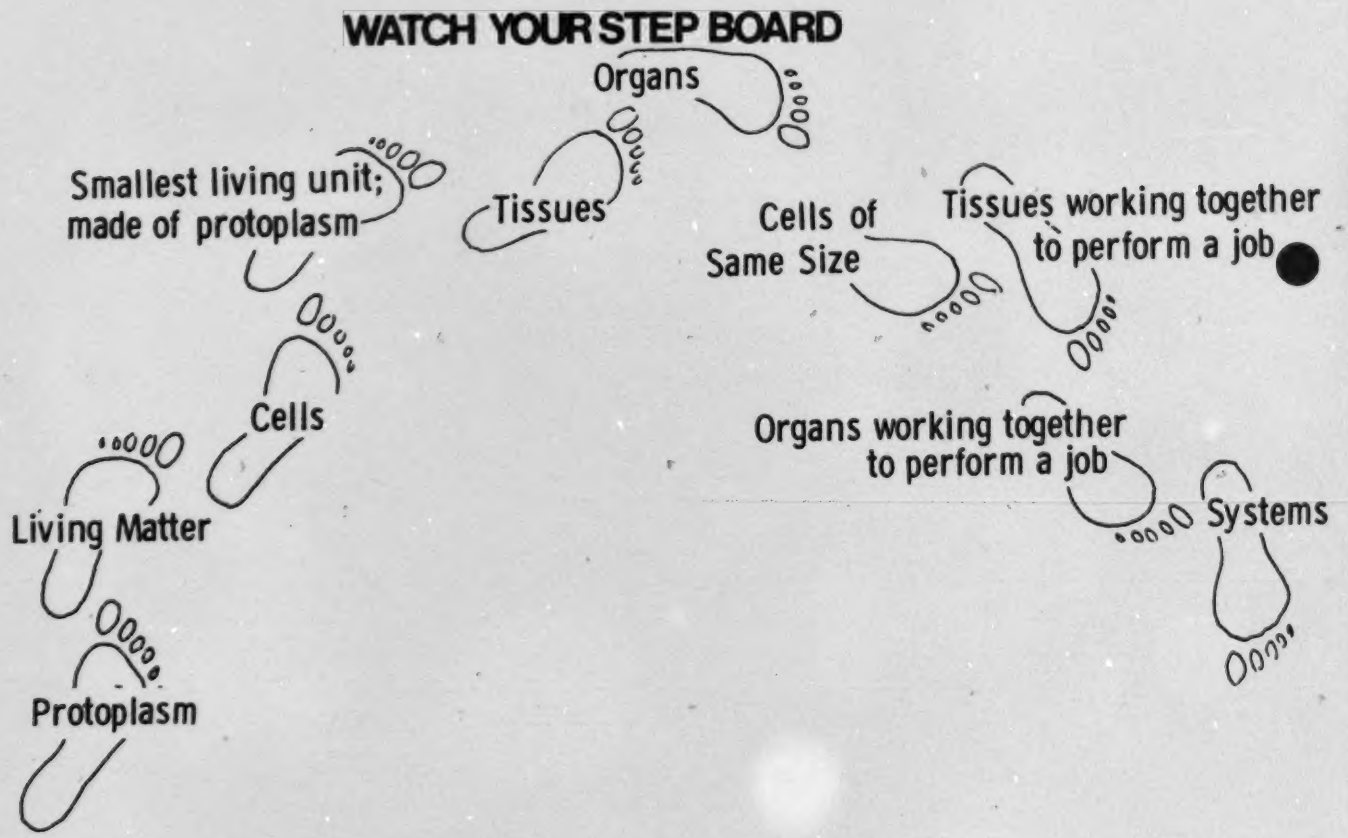
WATCH YOUR STEP - cont.

Variations and Extensions: Let children place feet on board for drill or concepts.

Interest Span: 30-40 minutes

Related Subject Area: Reading

Practical Hints: Laminate feet and boards for durability




ANSWER KEY:

protoplasm: living matter
cells: smallest living unit; made of protoplasm
tissues: cells of same size working together
organs: tissues working together to perform a job
systems: organs working together to perform a job

Physiology/Classification
10-12/Individual

# BLOOD BANK

Objective: The student will be able to expand the structure and function of the circulatory system to include parts of the blood.

Materials:

1. Blood Bank Worksheets (see next page)
2. Pen or Pencil
3. Reference Book

Procedures:

1. Student completes worksheet as directed.

Indication of Mastery: Completion of Blood Bank worksheets with 100% accuracy.

Variations and Extensions:

1. Draw worksheet on tagboard and then laminate it. Provide a felt pen for the child to use to complete activity.

Interest Span: 15-20 minutes

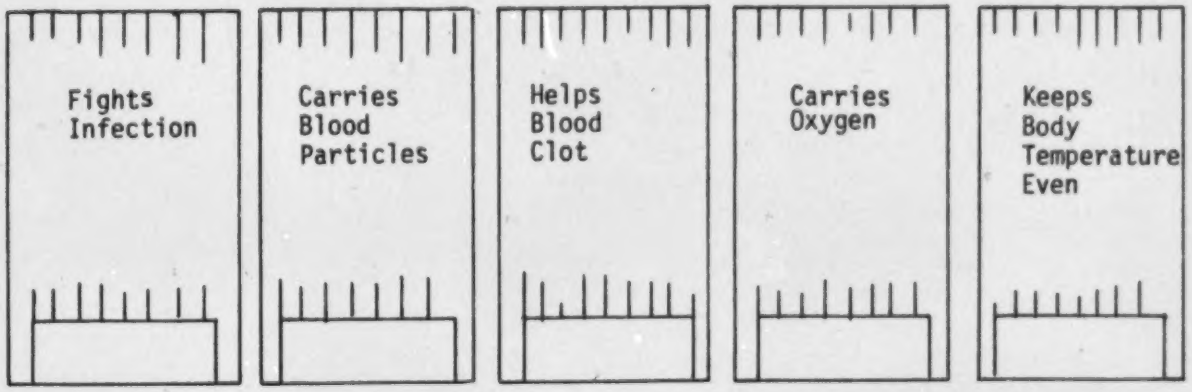
Related Subjects Areas: Language Arts

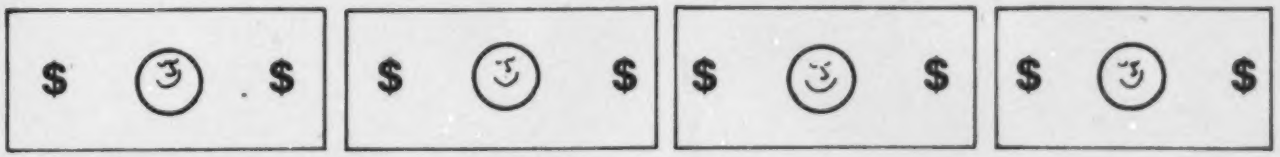
Practical Hints:

1. Use after the concepts have been introduced if you choose not to use reference books.

## BLOOD BANK WORKSHEET

A bank provides different kinds of services for you and your payments. Some of these services are checking accounts, savings accounts, and loans. Did you know that you have a bank inside of you? Your blood provides many different services for your body. Different parts of your blood perform these services. The parts of the blood and their services are listed below. Use a reference book to find out which part of the blood is responsible for each service. Draw a line from the blood part to the service it performs.




PLASMA RED CELLS WHITE CELLS PLATELETS

# RESPIRATION RACE

Objective: The student will be able to expand the structure and function of the respiratory system to include use of oxygen in the cells.

Materials:

1. An envelope with each of the 9 steps of the respiration process included inside. Each step should be typed or printed on paper and mounted on tagboard. (See next page for specific identification) Provide one envelope for each player.
2. Stopwatch
3. Answer Key (see next page)

Procedures:

1. Two or three players take an envelope.
2. At a starting signal, each player dumps out the contents of the envelope and puts the characteristics in the order in which they happen in the respiration process.
3. First player to do this correctly wins.
4. If the winner has made a mistake (verified by answer key) the other person is declared the winner.

Indication of Mastery: Ordering of steps with 80% accuracy

Variations and Extensions:

1. Have individual students time themselves and keep a bar graph record of their times.

Interest Span: 20-30 minutes

Related Subject Areas: Reading

Practical Hints:

1. Laminate cards

RESPIRATION RACE CHARACTERISTICS: List and Answer Key

1. Air enters through nose.
2. Air moves through windpipe.
3. Air passes through two bronchi.
4. The bronchi branch into bronchial tubes.
5. The air passes through the bronchial tubes into the two lungs.
6. Blood passing through the lungs gives off carbon dioxide and picks up oxygen from the air.
7. Blood containing oxygen turns a bright red.
8. Blood with oxygen goes to the left auricle of the heart.
9. Blood with oxygen circulates to all cells in the body.

# DIGESTIVE DUMMY

Objective: The student will be able to expand the structure and function of the digestive system to include liver, gallblader, and pancreas.

Materials:

1. Large roll of white or light brown paper and various colors of construction paper.
2. Transparency of outline of human form with all organs of the digestive system included. (mouth, teeth, saliva glands, esphogaus, stomach, small intestine, large intestine, liver, gallbladder, and pancreas.) See next page or reference book for a drawing of the digestive system.
3. Overhead projector or opaque projector according to type of picture used.

Procedures:

1. Student lays on a large sheet of paper and has another student trace around the outline of his/her body. Then he/she cuts it out.
2. Using the overhead, the student traces various organs of the digestive tract; each organ goes on a different color paper.
3. The organs are then placed on the appropriate place on the outline of the student's body and pasted down.
4. The student then labels the various organs or provides a color key on the legs areas of the body outline according to what color he/she chose for each organ.

Indication of Mastery: A completed body outline which includes all organs of the digestive system.

Variations and Extensions:

1. Have students display body outlines and organ drawings and explain them to other children.

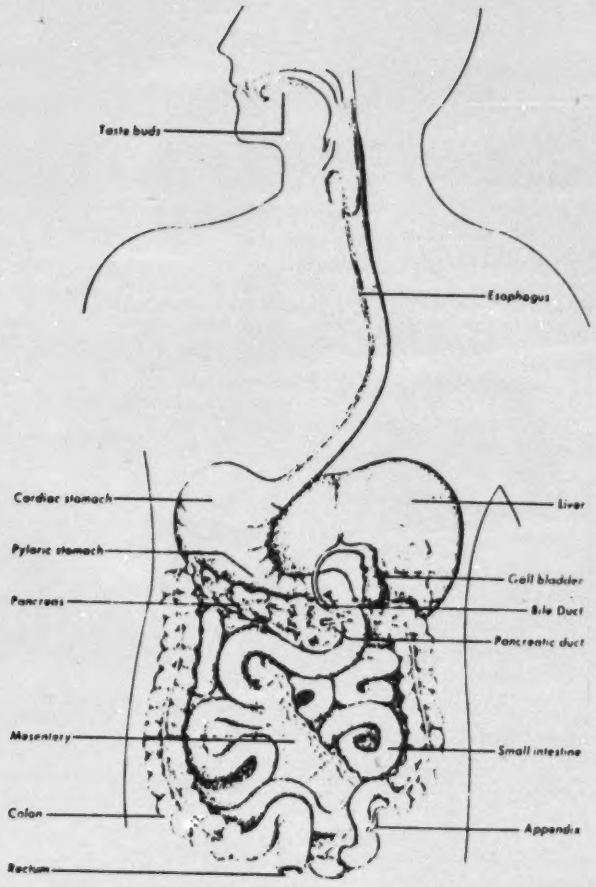
Interest Span: 40-50 minutes

Related Subject Areas: Fine Arts

Practical Hints:

1. Provide several projectors so 4 or 5 students can work at once.

# DIGESTIVE DUMMY TRANSPARENCY



# THE SKELETAL MAID

Objective: The student will be able to expand the structure and function of the skeletal system to include muscles, joints, tendons, and ligaments.

Materials: Skeletal Maid Card Deck

Procedures:

1. All cards are dealt among players. Players sort their hand for all pairs. A pair is 2 cards that name an organ and its function in the skeletal system. (e.g. clavicle, collarbone)

2. Player #1 (to the left of the dealer) turns to the player on his/her left and randomly picks a card from his/her hand. If player #1 has the match for the card picked, he/she pulls the pair from his/her hand and sets both cards in front of him/her. Players check their matches using the "Skeletal Maid Answer Key". If the card does not have a match, player #1 keeps the card picked in his/her hand. All players continue in turn, rotating clockwise.

3. The "Skeletal Maid" is the extra card that has no match. At the end of the game, the person holding the "Skeletal Maid" card is the loser.

Indication of Mastery: Participation in activity

Variations and Extensions:

1. The dealer removes the "Skeletal Maid" card and holding the deck face down, removes one card without anyone seeing it, placing it face down on the table. The match to this card becomes the "Mystery Skeletal Maid" card.

2. The teacher may adaptgame to "Jeopardy" format if desired.

Interest Span: 20-30 minutes

Related Subject Areas: Reading

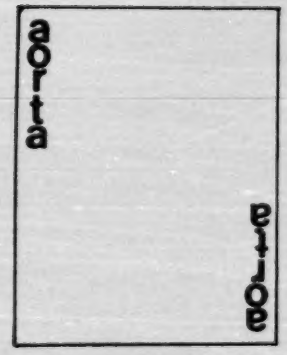
Practical Hints:

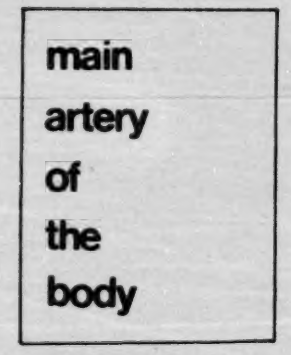
1. Laminate cards and Answer Key for durability.

## SKELETAL MAID ANSWER KEY

| | |
|---|---|
| ADOMINALS: | stomach muscles |
| CLAVICLE: | collarbone |
| COCCYX: | small bone that forms the end of the spine |
| DELTOID: | shoulder muscle |
| FEMUR: | upper leg bone |
| FIBULA: | small shin bone |
| HUMERUS: | upper arm bone |
| LIGAMENT: | tissue connecting bones at joints |
| MANDIBLE: | lower jaw bone |
| METACARPALS: | palm bones in hand |
| PATELLA: | knee cap |
| PELVIS: | hip bone |
| QUADRACEPS: | upper leg or thigh muscle |
| RADIUS: | lower arm bone |
| SCAPULA: | shoulder blade bone |
| STERNUM: | breastbone |
| TENDON: | tissue connecting muscles to bones |
| TIBIA: | large shin bone |

## SAMPLE SKELETAL MAID CARDS



# WASTEFUL THINKING

**Objective:** The student will be able to describe the major organs of the excretory system and their functions: colon (large intestine), skin, lungs, kidneys and urinary bladder.

**Materials:**

1. Question-answer sheet for each pair of students. These questions and answers should be included.

| Answer | Question |
|---|---|
| 1. the large intestine | Which organ does undigested food come from? |
| 2. the skin | Which organ releases salt, urea and water? |
| 3. to the urinary bladder | Where does urea go after it is filtered out of the blood? |
| 4. mixes with water | What happens to the urea in the kidneys? |
| 5. carbon dioxide | What waste is released through the lungs? |
| 6. perspiration | What is another word for sweat? |
| 7. in the urinary bladder | Where is urine stored? |
| 8. perspiration mixed with bacteria | What causes body odor? |
| 9. by washing the body every day | How can body odor be avoided? |
| 10. urea | What is the name of waste materials in the cells? |
| 11. when wastes are not on the skin | When can bacteria not grow? |
| 12. through the capillary membrane | How can wastes from the cells get into the blood? |
| 13. excreting | What is the process of getting rid of wastes called? |
| 14. because it makes us think about how we eliminate wastes | Why is this activity called "Wasteful Thinking"? |

**Procedures:**

1. One child reads an answer to another child. This child formulates a question for that answer.
2. Children change places and procedure is reversed.

**Indication of Mastery:** formulation of questions with 80% accuracy

**Variations and Extensions:**

1. Use as a worksheet. Children draw lines from questions to answers.

**Interest Span:** 20-30 minutes

**Related Subject Areas:** Language Arts

**Practical Hints:** Laminate worksheets so they can be reused.

# WHAT'S THE MESSAGE?

Objective: The student will be able to describe the major glands of the endocrine system and their functions: pituitary gland, thyroid gland, parathyroid gland, thymus gland, pancreas and adrenal glands.

Materials:

1. Six envelopes labeled with a name of a gland.
2. Six "messages" which indicate what the hormones secreted from each gland tells the body to do.
3. Answer key (see illustration).

Procedures:

1. The student classifies what messages a gland is giving the body by putting a written message in the proper envelope. Check using answer key.

Indication of Mastery: Classification of messages with 100% accuracy.

Variations and Extensions:

1. Have students formulate addresses for the glands to state general body location. For instance, the thyroid gland could be on "Windpipe Lane."
2. Have students write their own messages for the envelopes from memory or using research books.

Interest Span: 10-15 minutes.

Related Subject Areas: Language Arts

Practical Hints:

1. Laminate envelopes and messages for longer wear.

WHAT'S THE MESSAGE: ANSWER KEY

| Gland | Message |
|---|---|
| thyroid gland | control the rate at which energy is obtained from food |
| pituitary gland | controls growth |
| parathyroid gland | lower calcium |
| pancreas | lower amount of sugar in blood |
| thymus | helps bodies form antibodies (fight disease) |
| adrenal | prevents allergies<br>influences heartbeat<br>increases blood pressure |

# GIVE ME A PIECE OF YOUR MIND

Objective: The student will be able to expand the structure of the nervous system to include parts of the brain.

Materials

1. Diagrams of the brain with unlabeled parts and functions. There should be enough diagrams for each player in the group. Diagram is illustrated on the next page.
2. Grease pen or crayon for each player.
3. Diagram of brain with parts and functions labeled. (Answer Key Board)

Procedures

1. Two players hold an unlabeled diagram of the brain and another person holds a labeled diagram. This person serves as the leader and judges verbal responses of the players.
2. First player says to the second player, "Give me a piece of your mind".
3. The second player selects a certain part of the brain (such as medulla) and if the first player can identify where it is and what function it has, he/she can cross it out with a grease pen on his/her laminated card. If he/she cannot, the second player can ask for two pieces instead of one and if both are identified or explained, 2 pieces can be crossed out on his/her card.
4. The game is won when one player gets the "whole mind" or crosses out all parts.

Indication of Mastery: Participation in activity

Variations and Extensions:

1. Play three rounds so each player gets a chance to be the judge.

Interest Span: 20-30 minutes

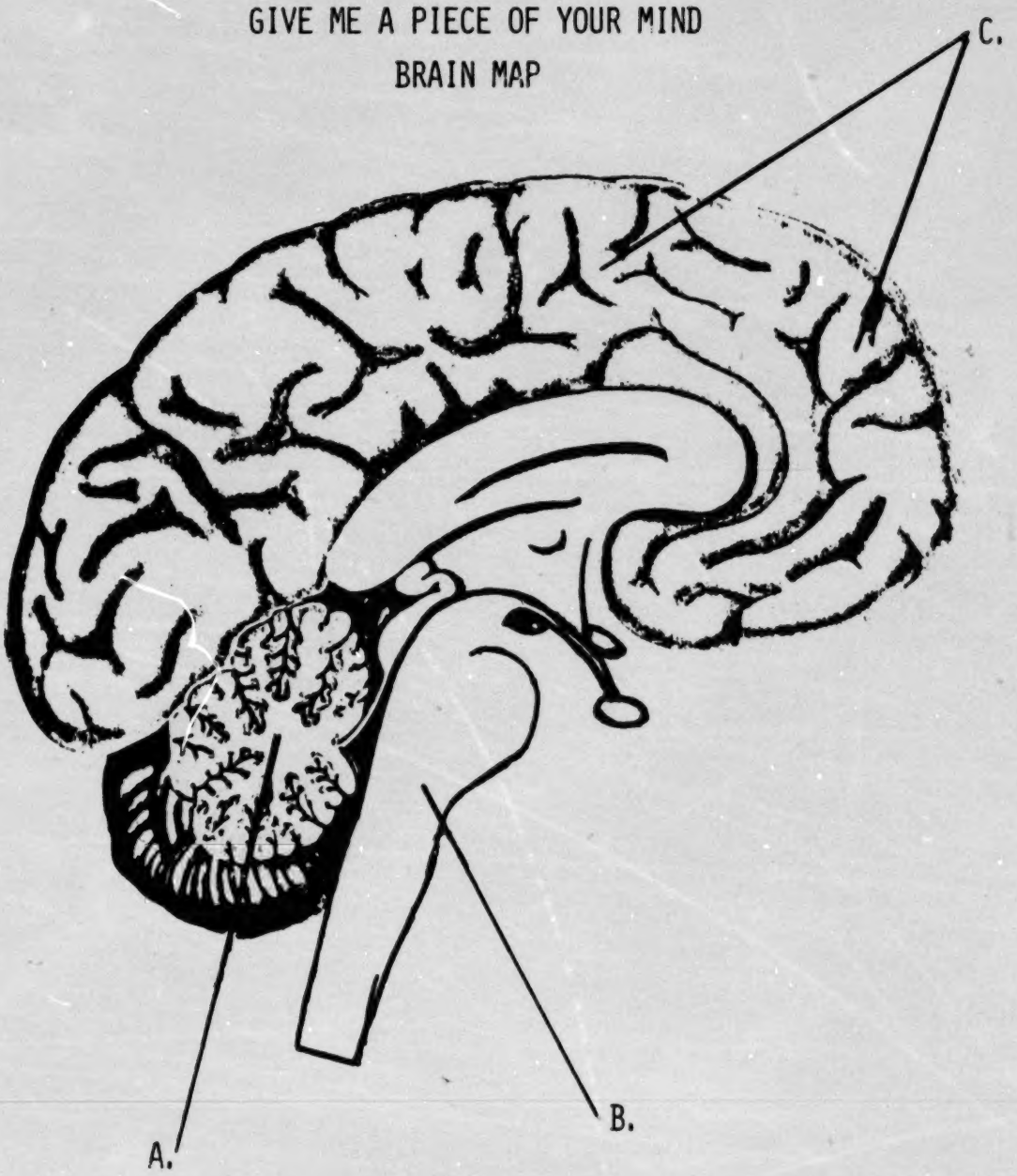
Related Subject Areas: Reading

Practical Hints:

1. Provide sponges for erasing laminated cards.

GIVE ME A PIECE OF YOUR MIND

BRAIN MAP




ANSWER KEY:

A. Cerebellum - helps coordinate muscular movements

B. Medulla - center for special reflexes that control vital functions

C. Cerebrum - interprets impulses; involved in higher mental activities such as remembering and thinking.

Physiology/Communicating
Modeling
10-12/Individual

# EAR HUNT

Objective: The student will be able to diagram and label the parts of the ear.

Materials:

1. Hidden word puzzle (see next page)
2. Diagram of ear with arrows pointing to the parts; but parts unlabeled. (see next page)

Procedures:

1. The student finds the parts of the ear in the hidden word puzzle.
2. Student puts the parts found in the puzzle on the proper place on the diagram of the ear.

Indication of Mastery: Completion of puzzle and sheet with 80% accuracy.

Variations and Extensions:

1. Project diagram on a transparency.

Interest Span: 20-30 minutes

Related Subject Areas: Reading

Practical Hints:

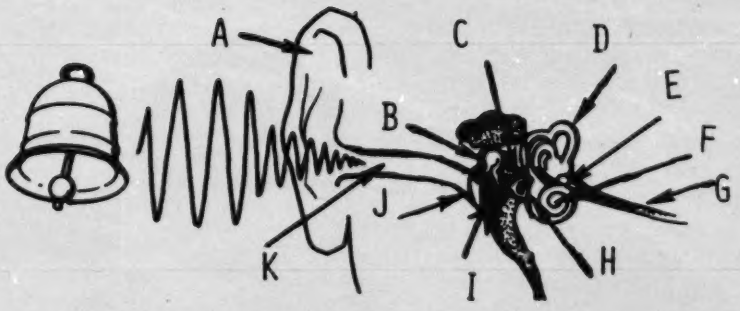
1. Make sure students are familiar with the concepts. Use as a review.

EAR HUNT HIDDEN WORD PUZZLE ANSWER KEY

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | P | I | N | N | A | U | D | I | T | O | R | Y | N | E | R | V | E |
| U | S | S | F | C | U | U | V | Z | E | F | J | C | T | Y | S | P | A |
| S | X | A | E | T | D | E | M | R | D | G | I | B | V | K | L | Q | R |
| T | Y | A | N | V | I | L | H | I | C | H | N | O | Q | L | W | R | D |
| A | T | V | N | B | T | Q | G | H | B | G | L | J | X | R | M | Y | R |
| C | T | U | W | D | O | V | A | L | W | I | N | D | O | W | U | B | U |
| H | O | M | Z | D | R | F | G | N | M | K | J | S | K | I | X | A | M |
| I | U | S | A | A | Y | A | I | J | J | H | O | T | P | H | A | Z | V |
| A | P | F | P | N | C | J | I | O | W | M | W | I | C | L | L | K | N |
| N | V | S | R | Q | A | B | O | P | X | D | U | R | L | B | J | I | X |
| T | Q | S | R | Q | N | P | H | A | M | M | E | R | E | F | G | H | C |
| U | T | W | O | C | A | F | E | N | K | A | V | U | K | Y | D | T | U |
| B | C | O | C | H | L | E | A | X | Z | Y | B | P | R | Z | C | S | Y |
| E | S | E | M | I | C | I | R | C | U | L | A | R | C | A | N | A | L |

## EAR HUNT HIDDEN WORD PUZZLE

E P I N N A U D I T O R Y N E R V E
U S S F C U U V Z E F D C T Y S P A
S X A E T D E M R D G I B V K L Q R
T Y A N V I L H I C H N O Q L W R D
A T V N B T Q G H B G L J X R M Y R
C T U W D O V A L W I N D O W U B U
H O M Z D R F G N M K J S K I X A M
I U S A A Y A I J J H O T P H A Z V
A P F P N C J I O W M W I C L L K N
N V S R Q A B O P X D U R L B J I X
T Q S R Q N P H A M M E R E F G H C
U T W O C A F E N K A V U K Y D T U
B C O C H L E A X Z Y B P R Z C S Y
E S E M I C I R C U L A R C A N A L




ANSWER KEY: A. Pinna B. Hammer C. Anvil D. Semicircular canal
E. Auditory nerve F. Cochlea G. Eustachian tube
H. Oval window I. Stirrup J. Ear drum K Auditory Canal

# "EYE SPY"

Objective: The student will be able to diagram the parts of the eye.

Materials:

1. "Eye Spy" card deck. The deck consists of 15 cards. The cards are as follows:

| Front | Back |
|---|---|
| A,B,C | 3 cards with entire diagram of eye. |
| D | 1 card with iris missing. |
| E | 1 card with anterior chamber missing. |
| F | 1 card with cornea missing. |
| G | 1 card with retina missing. |
| H | 1 card with ciliary muscle missing. |
| I | 1 card with vitreous missing. |
| J | 1 card with lens missing. |
| K | 1 card with posterior chamber missing. |
| L | 1 card with optic nerve missing. |
| M | 1 card with sclera missing. |
| N,O | 2 "Eye Spy" Cards |

(Parts are there but are unlabeled. See illustration on next page.)

2. Answer Key (See illustration on next page.)

Procedures:

1. Three or four students form a circle with the deck of cards in the center. One person acts as the leader and holds the answer key.
2. The first child draws a card. If he/she can identify if a part is missing and name the part, he/she keeps the card. If not, the card goes back on the botton of the pile. The leader verifies if a player is correct. Play continues counter-clockwise until all cards are gone.
3. Students who draw "Eye Spy" cards get to keep them.
4. The player with the most cards at the end of the game wins.

Indication of Mastery: Participation in Activity

Variations and Extensions: Match cards to pictures as in concentration.

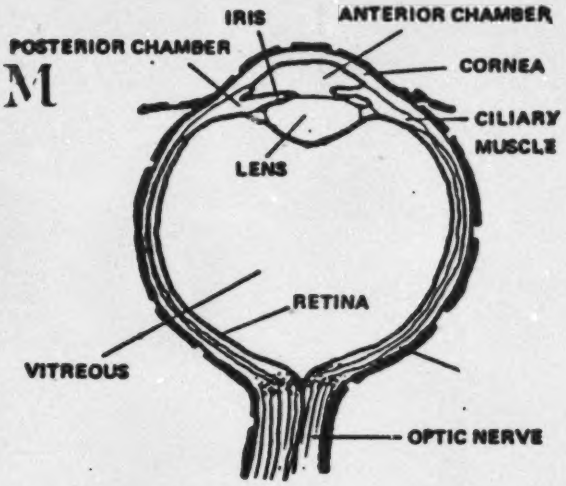
Interest Span: 20-30 minutes

Related Subject Areas: Math

Practical Hints:

1. Laminate cards and answer key for durability.

M

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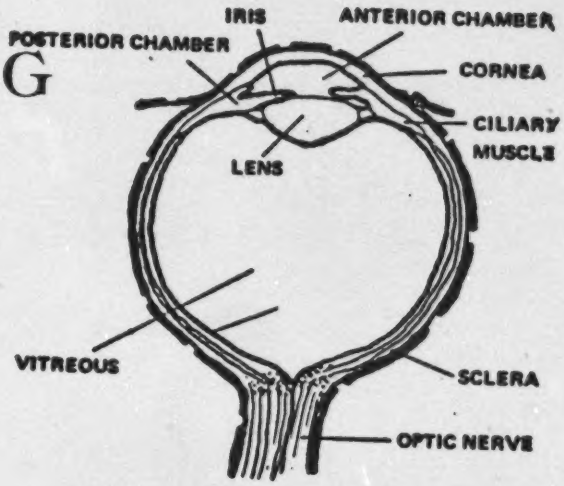


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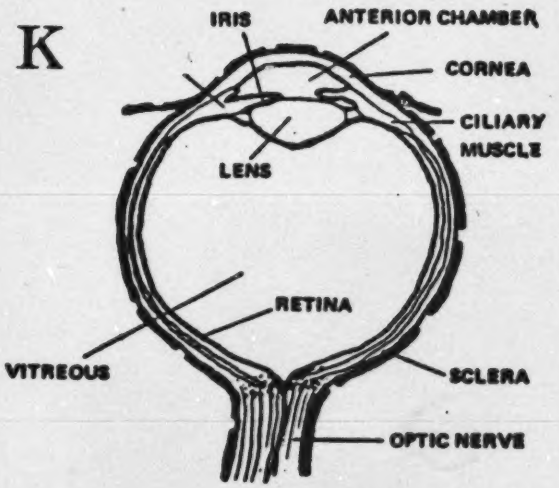


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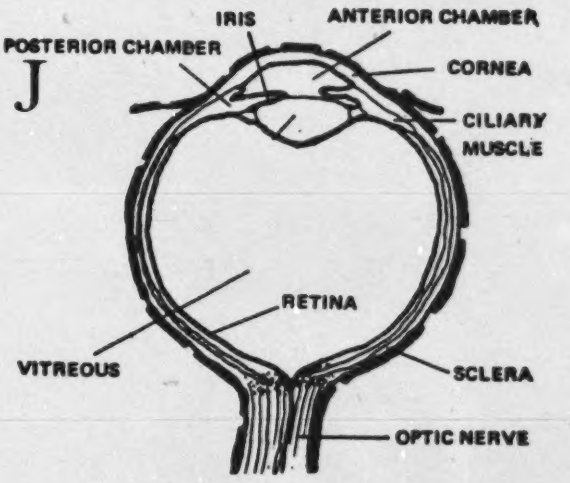
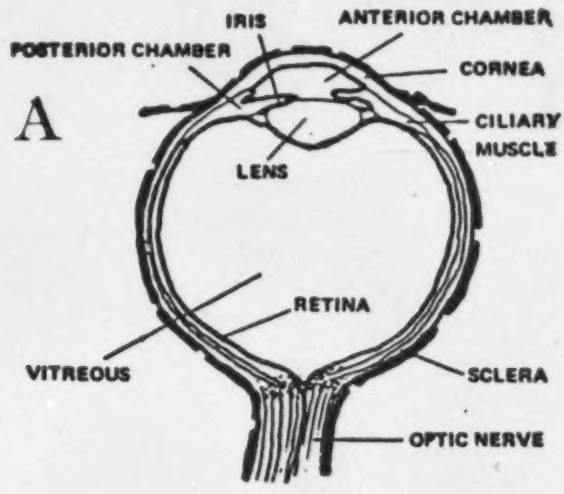
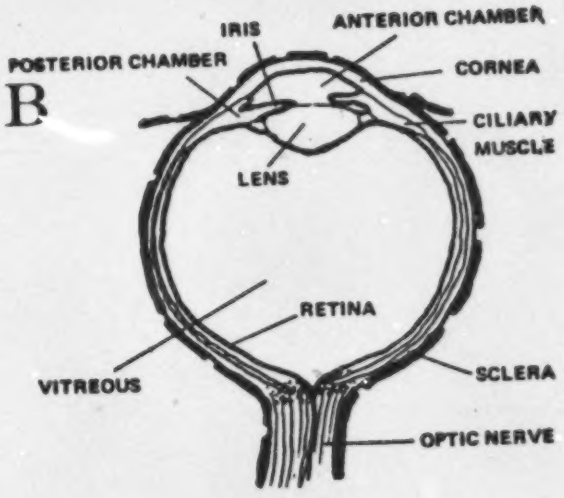
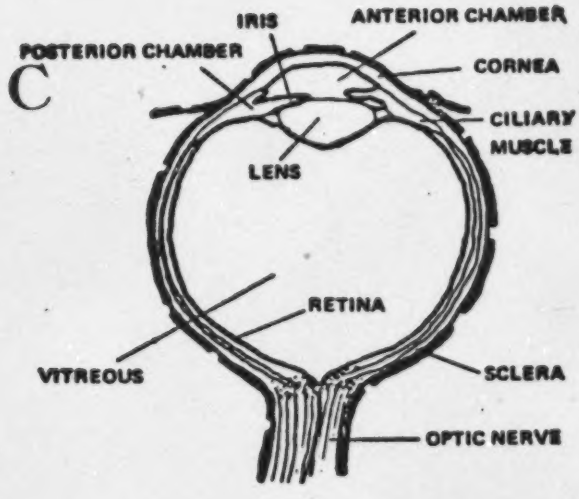
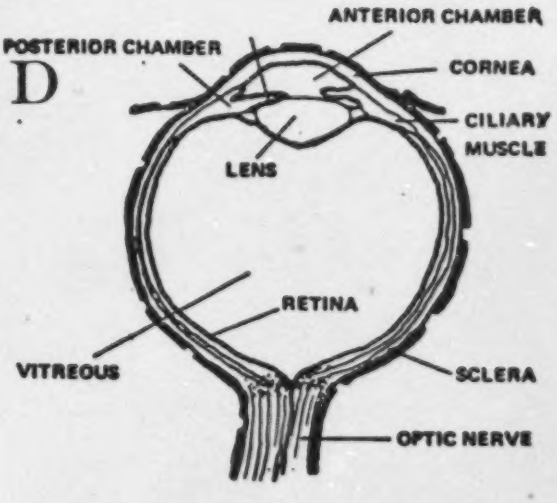


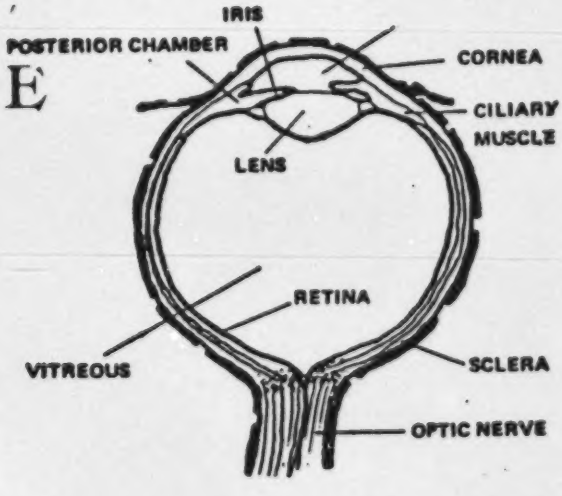
## SAMPLE "EYE SPY" CARDS

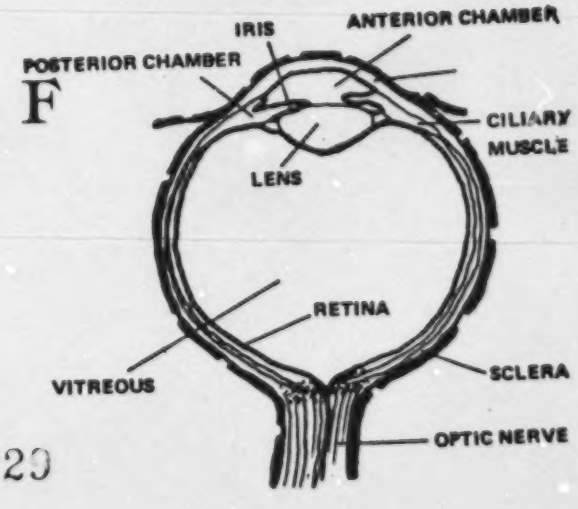
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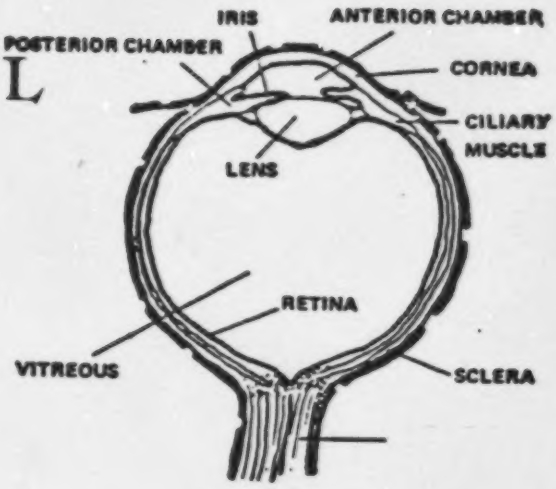
## SAMPLE "EYE SPY" CARDS

L

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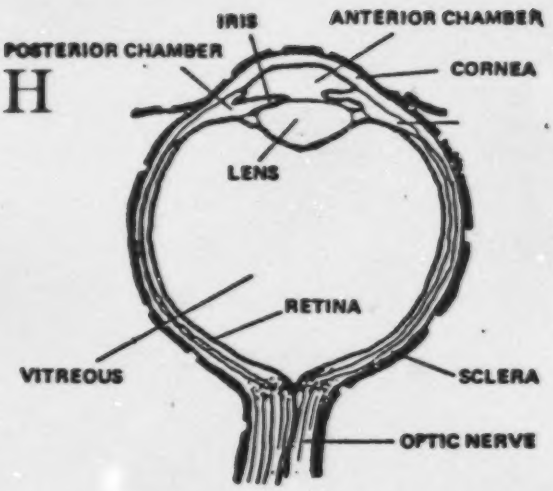


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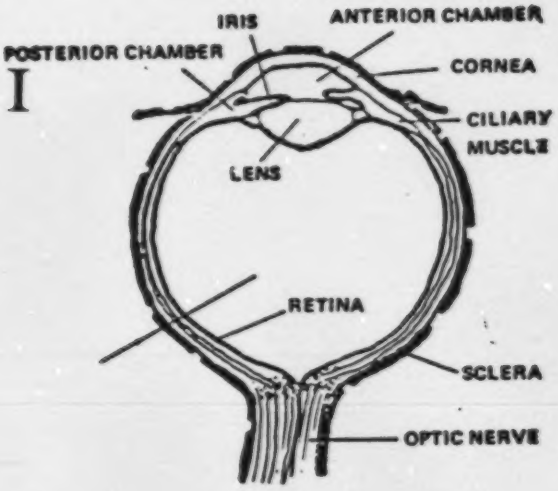


Physiology/Observation
10-12/Large group

# WHO KNOWS THEIR NOSE?

Objective: The student will be able to describe the parts of the nose and their functions.

Materials:

1. Item list for leader (see next page)
2. "I Knows My Nose" badges (see next page)

Procedures:

1. The leader reads an item on the list. If it is a true statement about the nose, the children put a finger on their nose. If it is a false statement, the children do not do anything.
2. The leader checks to see if students are doing the right action. If not, they are eliminated from the game.
3. Children that are not eliminated at the end of the list receive an "I Knows My Nose" badge.
4. Repeat with eliminated children.

Indication of Mastery: Participation in activity.

Variations and Extensions:

1. Divide the large group into smaller groups and allow children to be the leaders.

Interest Span: 20-30 minutes.

Related Subject Areas: Language Arts

Practical Hints

1. Use as a small group activity, and group the children in order to provide for more even competitiveness.

"I KNOWS MY NOSE" ITEM SHEET

1. Air you breathe enters through your nostrils. (True)
2. Your nostrils are the openings in your nose. (True)
3. The nostrils are separated by a thin wall called the septum. (True)
4. Lining the inside of your nostrils is mucous membrane. (True)
5. The mucous membrane does not secret a sticky substance. (False)
6. Mucous that is secreted in the nostrils does not help trap dust and germs. (False)
7. The nose is part of the nervous system. (True)
8. The nose is not part of the respiratory system. (False)
9. There are stiff hairs at the entrance of the nostrils. (True)
10. Other hairs inside the nose help filter smaller particles. (True)
11. You smell with your nose. (True)
12. Cilia are a type of hair in your nose. (True)
13. Wavelike motions of the cilia work to keep dust and other things from going further than the nose. (True)
14. The nose does not have any other functions beside smelling and cleaning air. (False)
15. The nose provides a place for air to be warmed. (True)
16. There are narrow curving chambers in the nasal cavity through which air passes. (True)
17. The thin membrane that lines channels in the nasal cavity contain many blood capillaries. (True)
18. The blood in the capillaries is warm. (True)

SAMPLE
BADGE

232

Physiology/Classification
Communicating, Experimenting
10-12/Individual

# TASTEFUL TONGUES

Objective: The student will be able to explain the "taste" functions of the areas of the tongue.

Materials:

1. A sample of sweet, sour, salty, and bitter food.
2. Tongue Map Sheet (See next page)
3. Tongue Map Answer Key (See next page)

Procedures:

1. Child place food on his/her tongue and decides which area is responsible for what taste. He/She can use tongue map sheet to decide where to place food.
2. Child fills in map key to show locations of his/her various taste sensations.

Indication of Mastery: Participation in Activity

Variations and Extensions:

1. Make transparencies of the tongue maps of various children. Project them and compare similarities and differences. (Most tongues will be basically the same.)

Interest Span: 30-40 minutes

Related Subject Areas: Study Skills

Practical Hints:

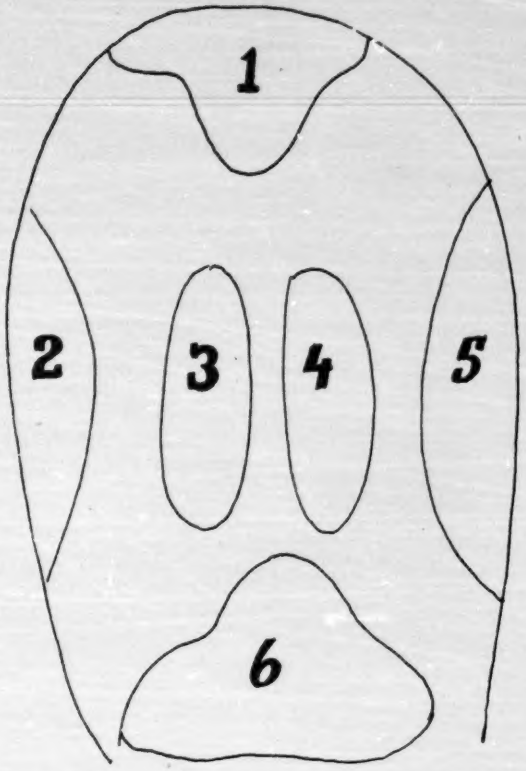
1. Have children put small portion of food on the tongue and take a swallow of water between different foods.
2. Use a mirror to locate part of tongue that responds to material.
3. The answers on the key are for a "typical"tongue. Be sure children understand that the taste areas on tongues do vary.

(Adapted from You-A Body of Science, Scholastic Book Services, May, 1971)

# TONGUE MAP

Place the foods given to you on each of the areas of the tongue as indicated on the map below.

## ANSWER KEY




Your Responses

1.

2.

3.

4.

5.

6.

General Responses for Tongues

1. Sweet
2. Salty
3. Sour
4. Sour
5. Salty
6. Bitter

# BODY TEAMS

Objective: The student will be able to classify body organs according to their system.

Materials:

1. 5 boxes the same size, with a football helmet drawn on each. Print one of the following team titles on each of the football helmets: See below

   a. Cincinnati Circulatories
   b. Nervous New Yorkers
   c. Digestion Dolphins
   d. San Francisco Skeletons
   e. Rhode Island Respiratories

2. Laminated pictures of each of the following body parts:

| | | | |
|---|---|---|---|
| muscles | brain | bones | lungs |
| heart | lungs | spinal cord | mouth |
| veins | arteries | esophagus | stomach |
| kidneys | pancreas | nose | intestines |

Procedures:

1. The child sorts organs into boxes according to the system to which they belong.

Indication of Mastery: Classification of organs into systems with 80% accuracy

Variations and Extensions

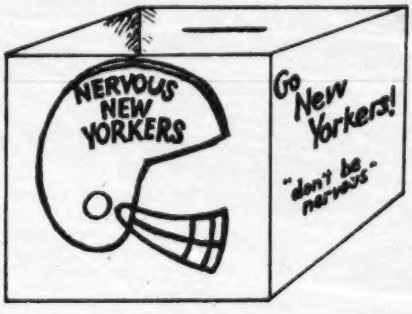
1. Have students do research to find out what organs belong in each system.
2. Use word cards in place of laminated pictures of the body parts.

Interest Span: 20 minutes

Related Subject Areas: Language Arts

Practical Hints:

1. Make an answer key so activity is self-correcting.




SAMPLE BOX FOR BODY TEAMS

Physiology/Classification
Small Group/10-12

# BODY BINGO

Objective: The student will be able to classify an organ into its correct system.

Materials:

1. Six Body Bingo cards constructed as follows:

   a. Cut out a piece of tagboard 8 x 8".
   b. Draw on it a grid of seven squares across and seven squares down.
   c. Put a star in the center square to indicate a "free" spot.
   d. Fill in the other spaces with names of the systems. Use each of the following systems six times:

| | |
|---|---|
| excretory | circulatory |
| reproductive | nervous |
| endocrine | skeletal |
| digestive | respiratory |

2. Thirty-four (34) 2 x 3" calling cards with one of each of the following organs printed on them:

| | | |
|---|---|---|
| nose | brain | urinary bladder |
| mouth | spinal cord | skin |
| windpipe | nerves | bones |
| lungs | pituitary gland | muscles |
| diaphragm | thyroid gland | joints |
| blood cells | parathyroid gland | tendons |
| heart | thymus | teeth |
| vein | pancreas | saliva glands |
| arteries | adrenal glands | esophagus |
| capillaries | large intestines | stomach |
| liver | kidneys | small intestine |
| | gall bladder | |

3. Buttons or other small items for markers.

Procedures:

1. Distribute bingo cards and markers. Select a reader.

2. Play like regular bingo. Reader reads an organ and the players cover all spaces that show a system in which that organ belongs. (Remember that organs such as the liver are part of two systems.)

3. The first player to get a row across, down, or diagonally wins.

Indication of Mastery: participation in activity.

Variations and Extensions:

1. Check cards before they are cleared to review the parts.

Interest Span: 40-50 minutes

Practical Hints:

1. Laminate playing and calling cards for longer wear.